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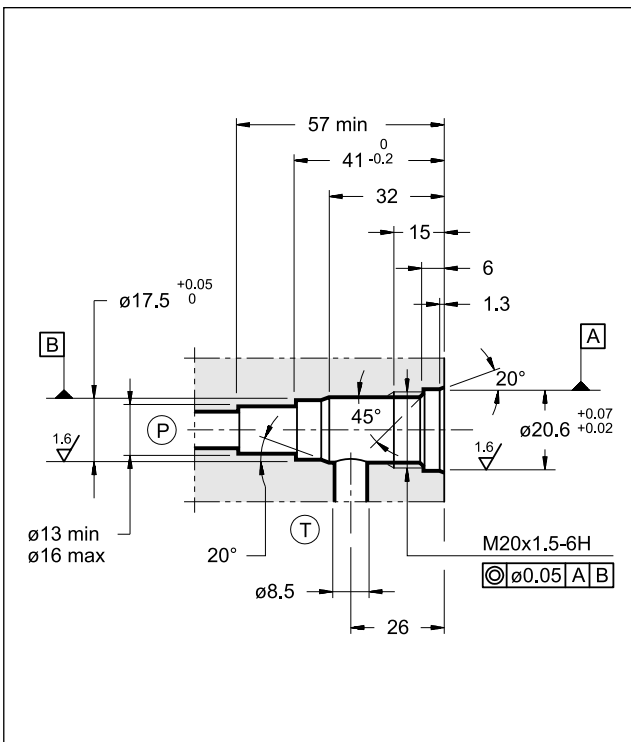
DIRECT OPERATED PRESSURE CONTROL VALVE SERIES 22



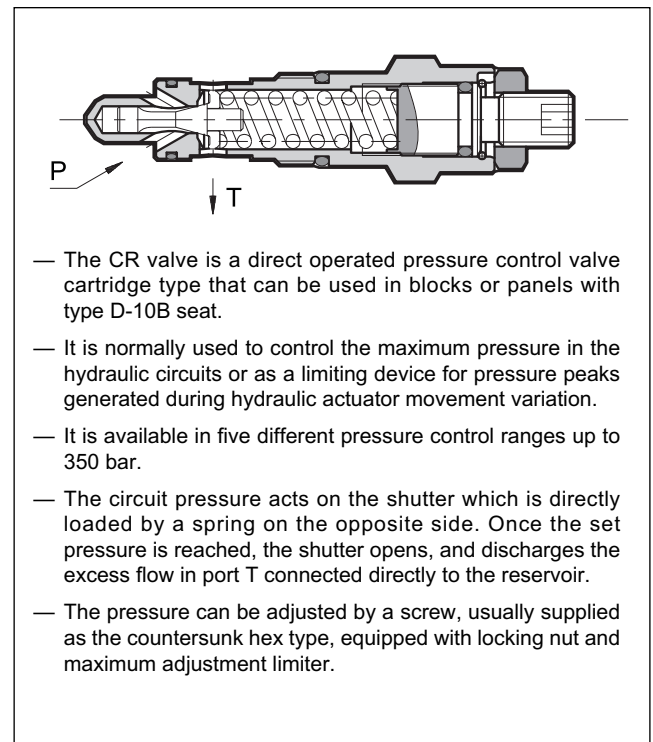
CARTRIDGE TYPE

p max 350 bar
Q max 50 l/min

SEAT DIMENSIONS: D-10E



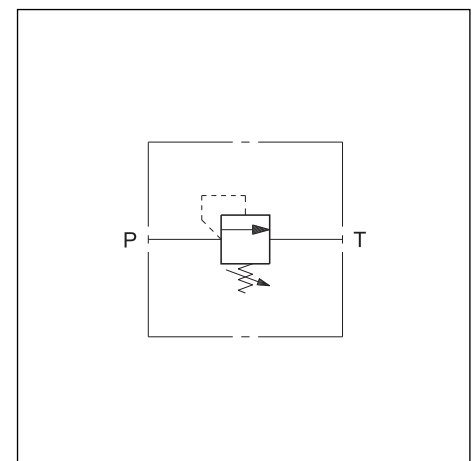
OPERATING PRINCIPLE



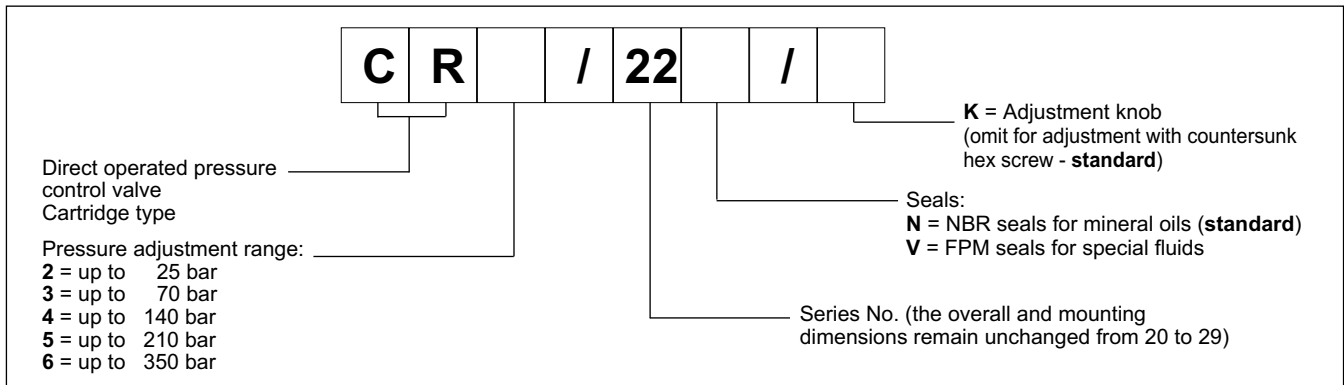
PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

Max working pressure	bar	350
Minimum controlled pressure and pressure drop	see diagram	
Maximum flow rate	l/min	50
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	0,16
Surface treatment: electrolytic zinc covering	Fe / Zn8 / B ISO 2081	

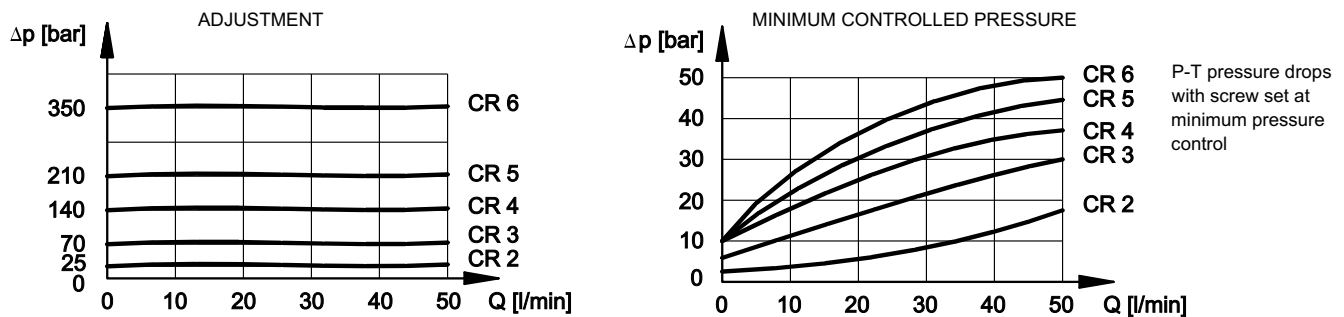
HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE



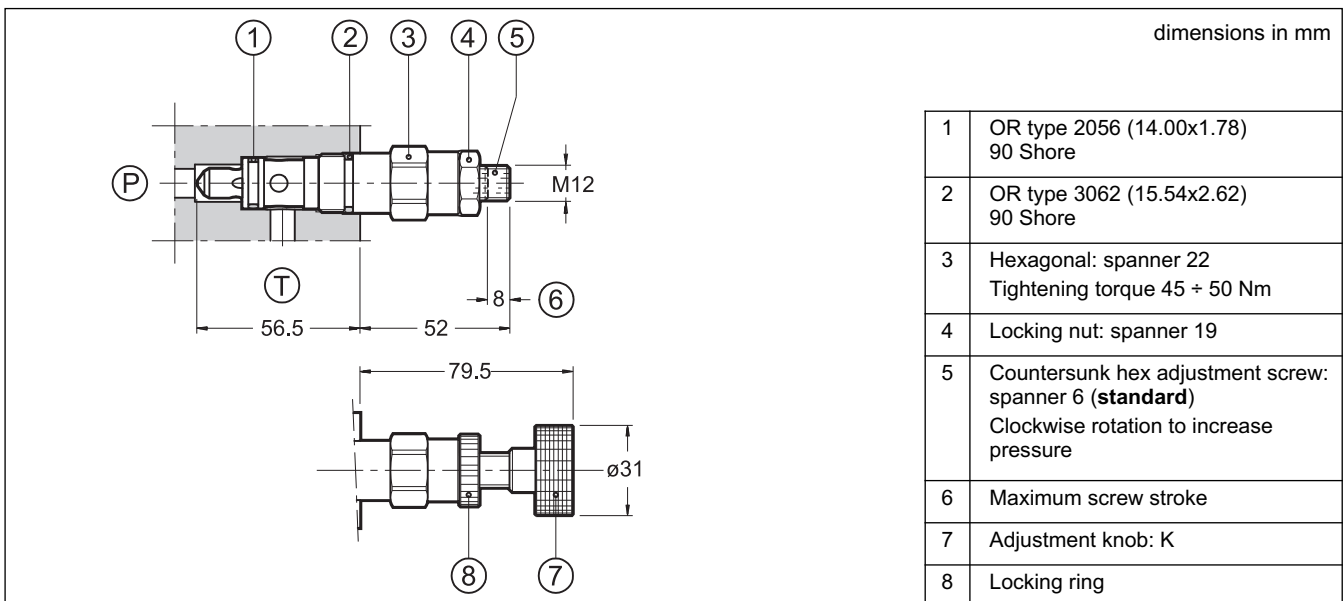
2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS





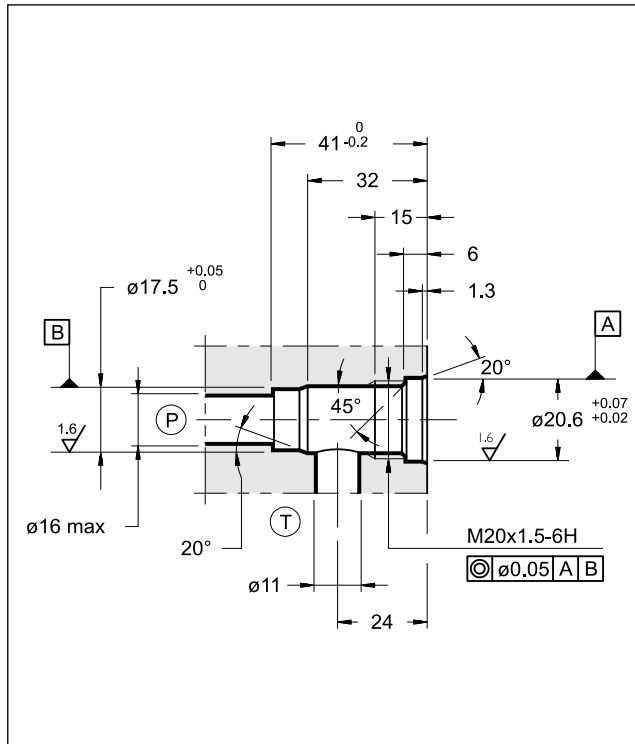
CRQ

PILOT OPERATED PRESSURE CONTROL VALVE SERIES 12

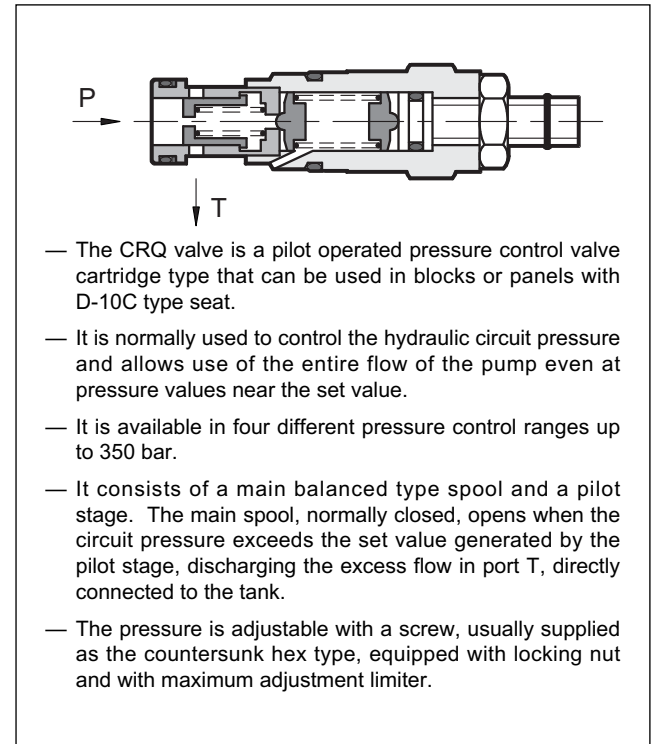
CARTRIDGE TYPE

p max 350 bar
Q max 100 l/min

SEAT DIMENSIONS: D-10C



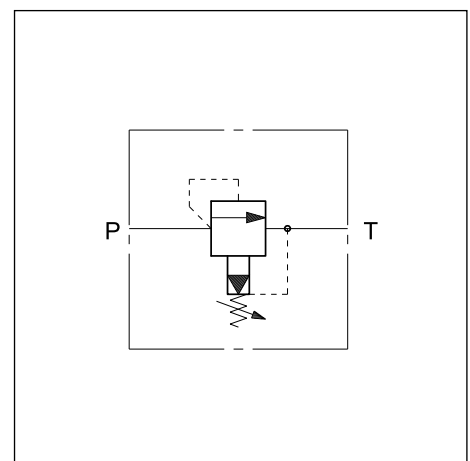
OPERATING PRINCIPLE



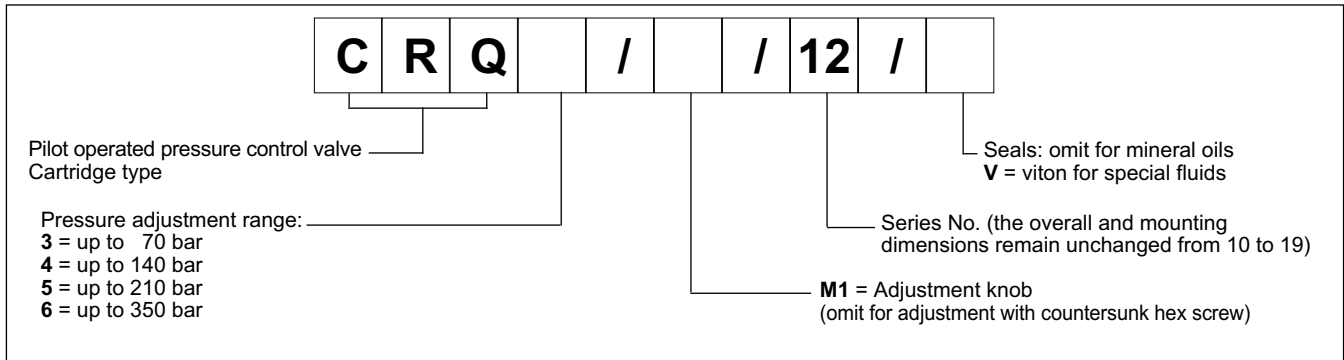
PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

Max working pressure	bar	350
Minimum controlled pressure and pressure drop	see diagram	
Maximum flow rate	l/min	100
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	0,16
Surface treatment:electrolytic zinc covering	Fe/Zn 8/B ISO 2081	

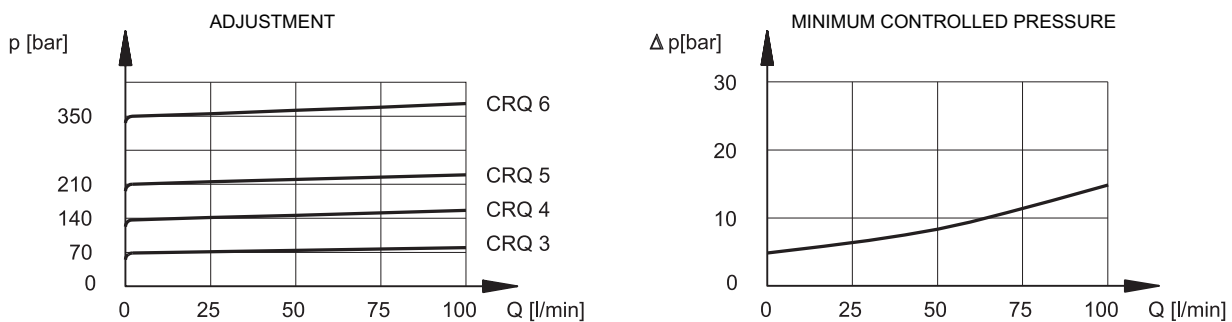
HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE



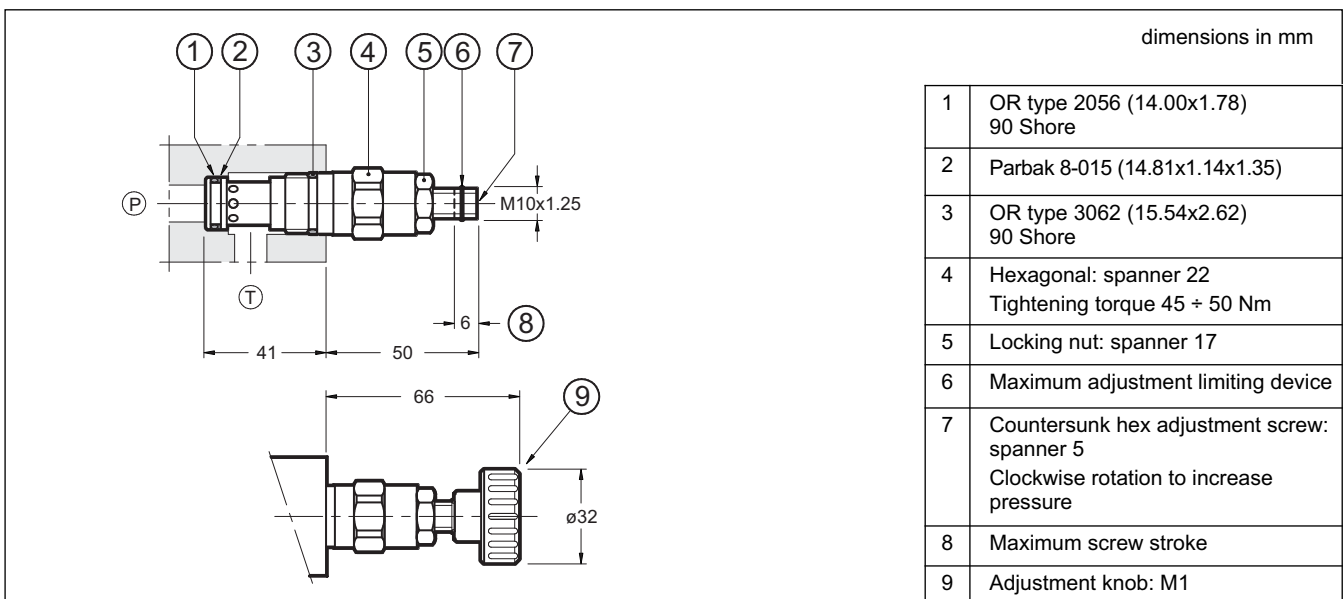
2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS





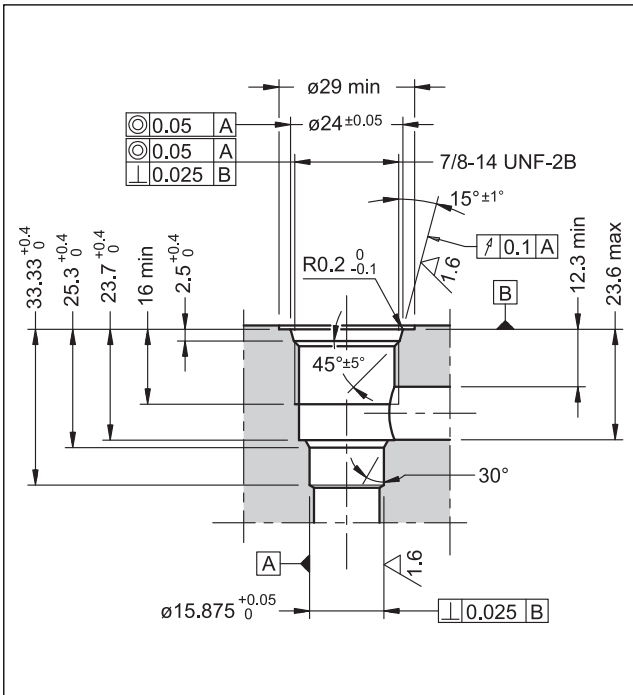
PRK10

PILOT OPERATED PRESSURE CONTROL VALVE SERIES 12

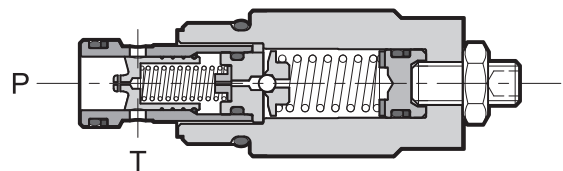
CARTRIDGE TYPE
seat 7/8-14 UNF-2B (SAE - 10)

p max **350** bar
Q max **120** l/min

SEAT DIMENSIONS: 7/8 - 14 UNF-2B (SAE - 10)



OPERATING PRINCIPLE



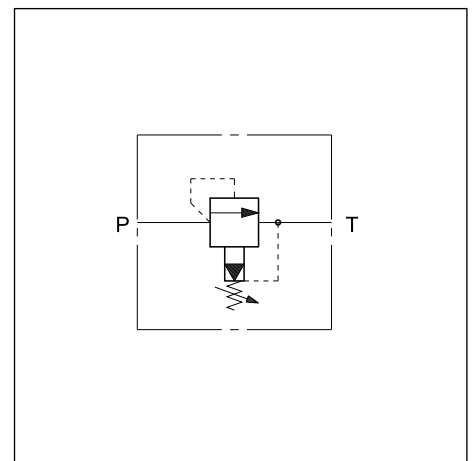
- The PRK10 valve is a pilot operated pressure control valve, cartridge type, that can be used in blocks or panels with 7/8-14 UNF-2B (SAE - 10) type seat.
- It is used to control the hydraulic circuit pressure and allows use of the entire flow of the pump even at pressure values near the set value.
- It consists of a main balanced type spool and a pilot stage. The main spool, normally closed, opens when the circuit pressure exceeds the set value generated by the pilot stage, discharging the excess flow in port T, directly connected to the tank.
- It's available in 4 pressure control ranges from 6 to 350 bar.
- The PRK10 are supplied with a finishing surface treatment (zinc-nickel) suitable to ensure a salt spray resistance up to 600 h (test according to UNI EN ISO 9227 standards and test evaluation according to UNI EN ISO 10289 standards)
- The pressure is adjustable by a socket set screw with locking nut, or by knob.

PERFORMANCES

(measured with mineral oil of viscosity 36 cSt at 50°C)

Max working pressure	bar	350
Minimum controlled pressure and pressure drop	see diagram	
Maximum flow rate	l/min	120
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 + 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	0,2
Surface finishing: galvanic treatment	zinc-nickel	

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

P	R	K	10	-	/	12	/	
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Pressure control valve, pilot operated

Cartridge type _____

Size _____

Pressure adjustment range: _____

070 = from 14 to 70 bar (17 bar/turn) **210** = from 14 to 210 bar (47 bar/turn)
140 = from 14 to 140 bar (32 bar/turn) **350** = from 14 to 350 bar (78 bar/turn)

Option: **K** = Adjustment knob. Omit for adjustment with hex socket screw (**standard**)

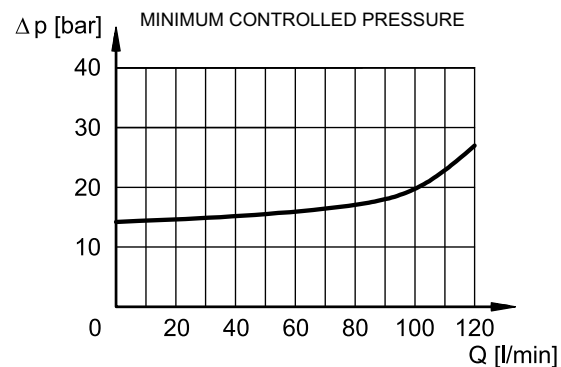
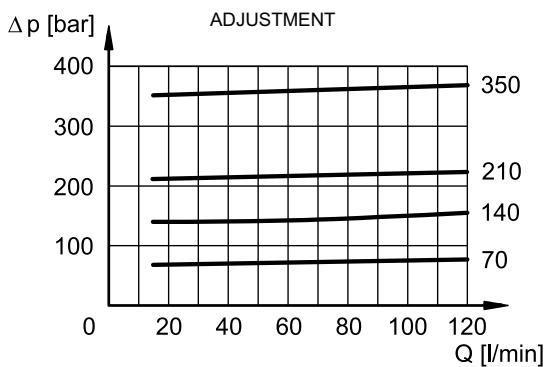
Seals:
N = NBR seals for mineral oils (**standard**)
V = FPM seals for special fluids

Series No. (the overall and mounting dimensions remain unchanged from 10 to 19)

⚠ NOTE: the maximum regulated pressure value is reached when the screw is flush with the nut.
Screwing over this limit can damage the valve.

2 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

1	OR type 2050 (12.42x1.78)
2	Parbak 8-014 (13.23x1.14x1.35)
3	OR type 3-910 (19.18x2.46)
4	Cartridge tightening: spanner 24 Tightening torque 38 Nm
5	Locking nut: spanner 13
6	Socket hex adjustment screw: Hex key 4. Rotate clockwise to increase pressure
7	Locking ring
8	Adjustment knob: K



DBV

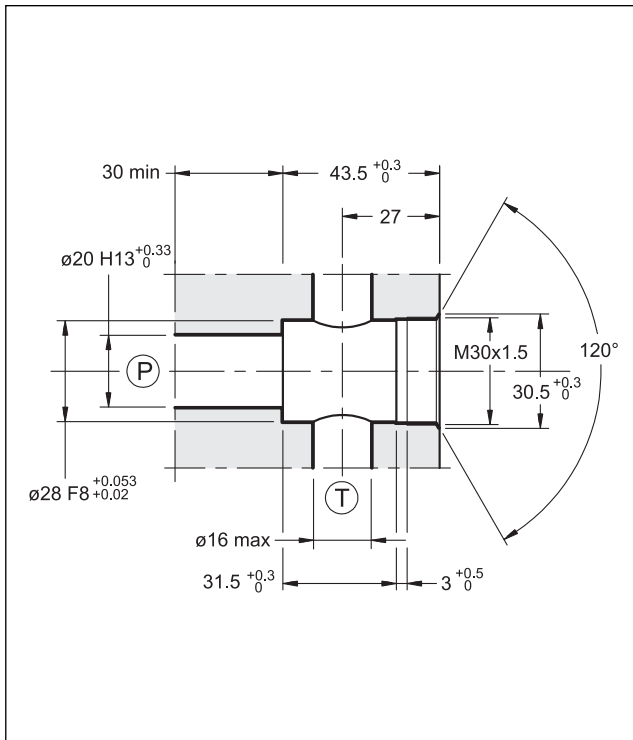
DIRECT OPERATED PRESSURE CONTROL VALVE

SERIES 10

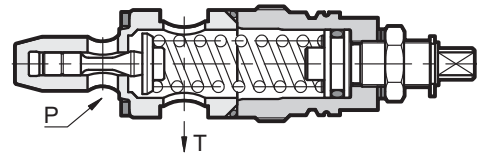
CARTRIDGE TYPE

p max 380 bar
Q max 120 l/min

SEAT DIMENSIONS: D-10E



OPERATING PRINCIPLE



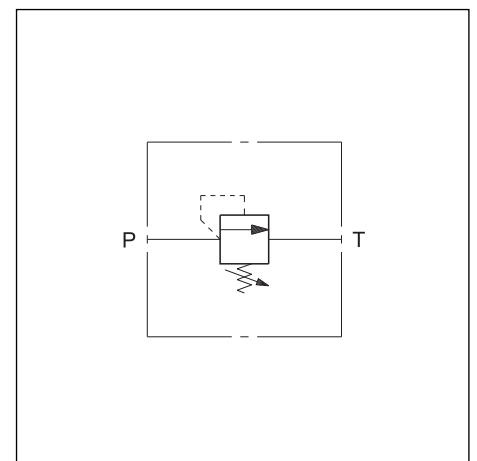
- The DBV valve is a direct operated pressure control valve cartridge type that can be used in blocks or panels with seat.
- It is normally used to control the maximum pressure in the hydraulic circuits or as a limiting device for pressure peaks generated during hydraulic actuator movement variation.
- It is available in different pressure control ranges up to 300 bar.
- The circuit pressure acts on the shutter which is directly loaded by a spring on the opposite side. Once the set pressure is reached, the shutter opens, and discharges the excess flow in port T connected directly to the reservoir.
- The pressure can be adjusted by a screw, equipped with locking nut and maximum adjustment limiter.

PERFORMANCES

(measured with mineral oil of viscosity 36 cSt at 50°C)

Max working pressure	bar	380
Minimum controlled pressure and pressure drop	see diagram	
Maximum flow rate	l/min	120
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	0,25
Surface treatment: electrolytic zinc covering	Fe/Zn 8/B ISO 2081	

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

D	B	V	-	/	10	/	
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Direct operated pressure control valve
Cartridge type

Pressure adjustment range:

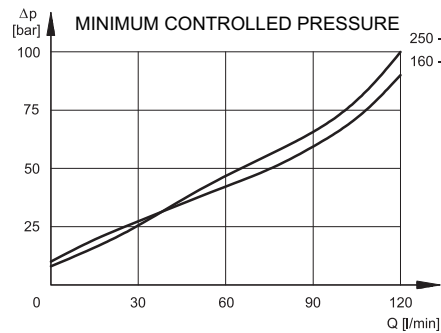
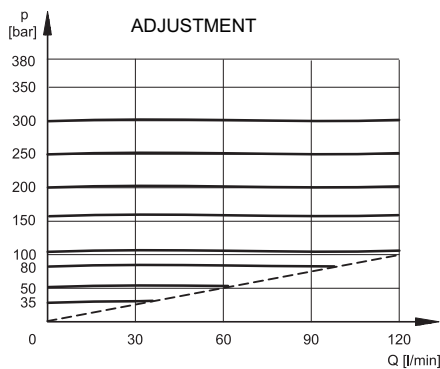
035 = up to 35 bar	160 = up to 160 bar
050 = up to 50 bar	200 = up to 200 bar
080 = up to 80 bar	250 = up to 250 bar
100 = up to 100 bar	300 = up to 300 bar

K = Adjustment knob
(omit for adjustment with hex screw - **standard**)

Seals:
N = NBR seals for mineral oils (**standard**)
V = FPM seals for special fluids

Series No. (the overall and mounting dimensions remain unchanged from 10 to 19)

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



P-T pressure drops with screw set at minimum pressure control

3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

1	Socket hex adjustment screw: spanner 8 (standard) Clockwise rotation to increase pressure
2	Locking nut: spanner 17
3	Hexagonal spanner 24 Tightening torque 70 ÷ 100 Nm
4	OR type 130 (22.22x2.62) 90 Shore
5	Maximum screw stroke
6	Adjustment knob: K



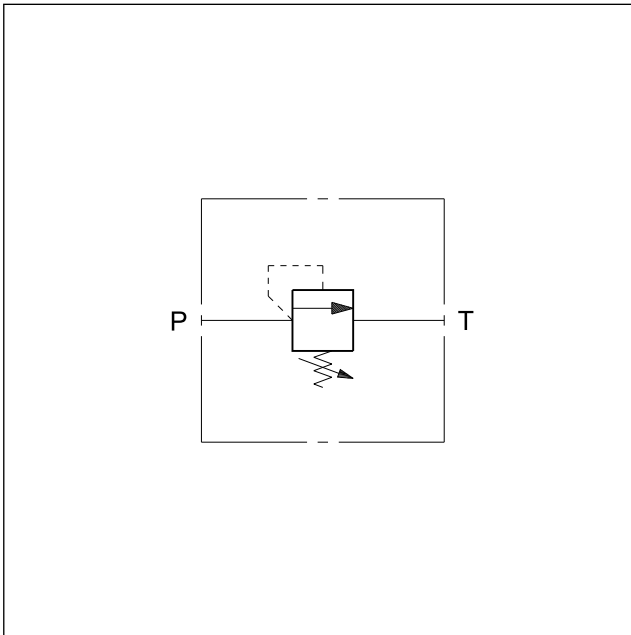
CD1-W

DIRECT OPERATED PRESSURE CONTROL VALVE SERIES 10

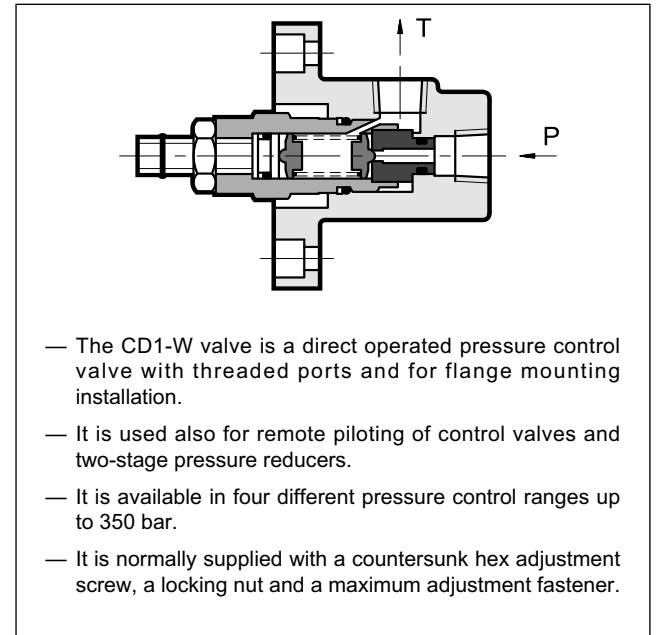
THREADED PORTS

p max 350 bar
Q max 3 l/min

HYDRAULIC SYMBOL



OPERATING PRINCIPLE

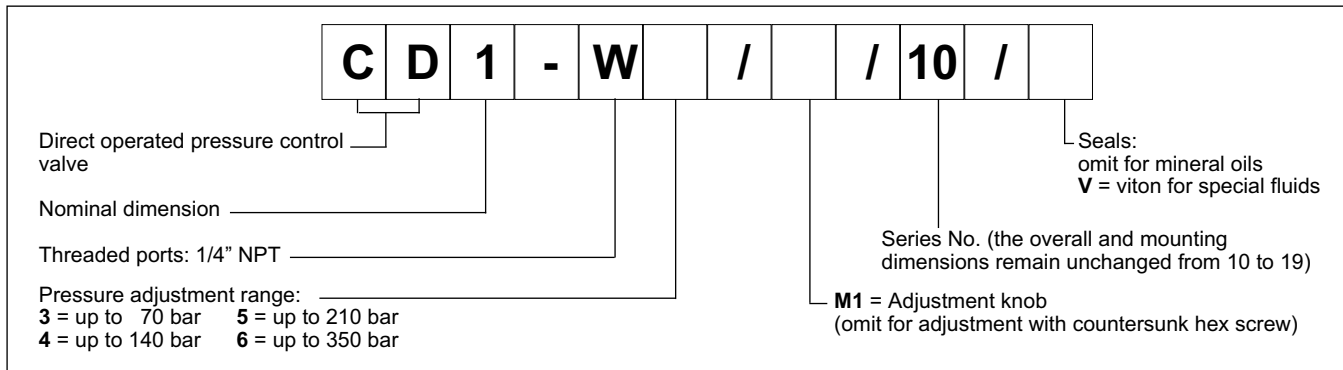


- The CD1-W valve is a direct operated pressure control valve with threaded ports and for flange mounting installation.
- It is used also for remote piloting of control valves and two-stage pressure reducers.
- It is available in four different pressure control ranges up to 350 bar.
- It is normally supplied with a countersunk hex adjustment screw, a locking nut and a maximum adjustment fastener.

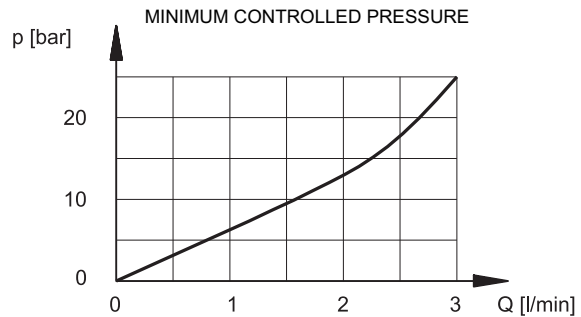
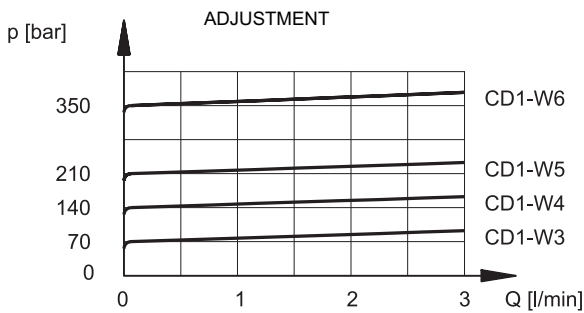
PERFORMANCE RATINGS (measured with mineral oil of viscosity 36 cSt at 50°C)

Maximum operating pressure	bar	350
Minimum controlled pressure	see diagram	
Maximum flow rate	l/min	3
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 + 400
Recommended filtration	according to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	1,2

1 - IDENTIFICATION CODE



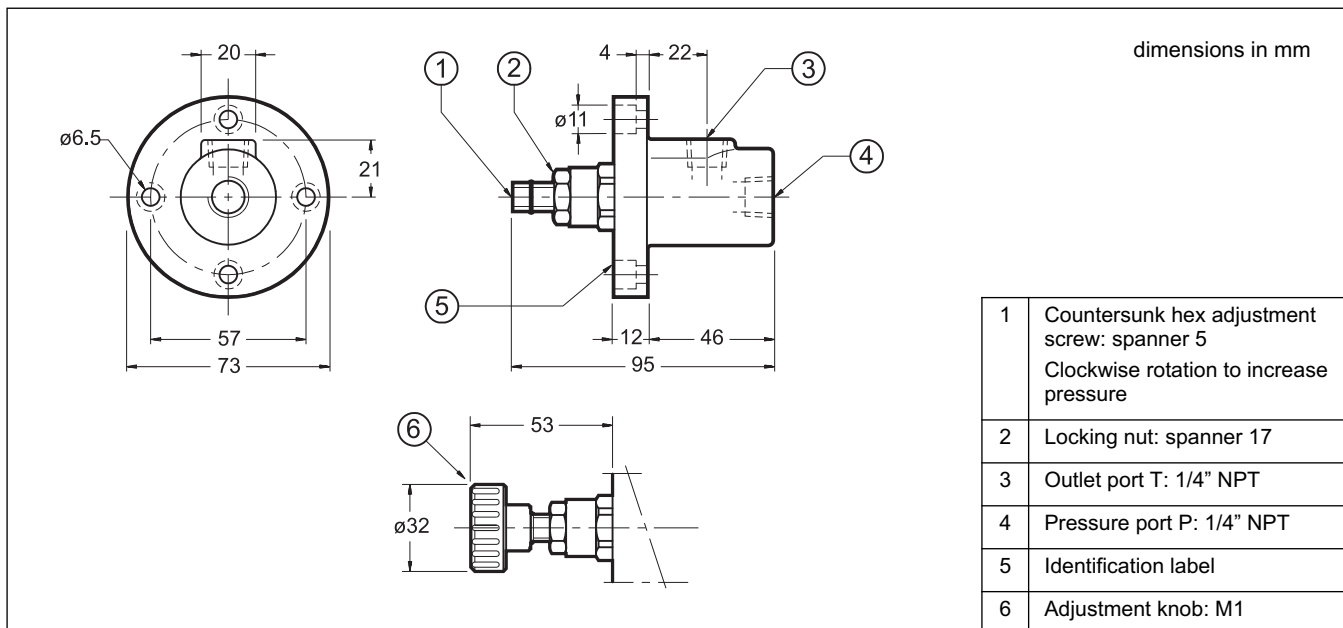
2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS





RM*-W

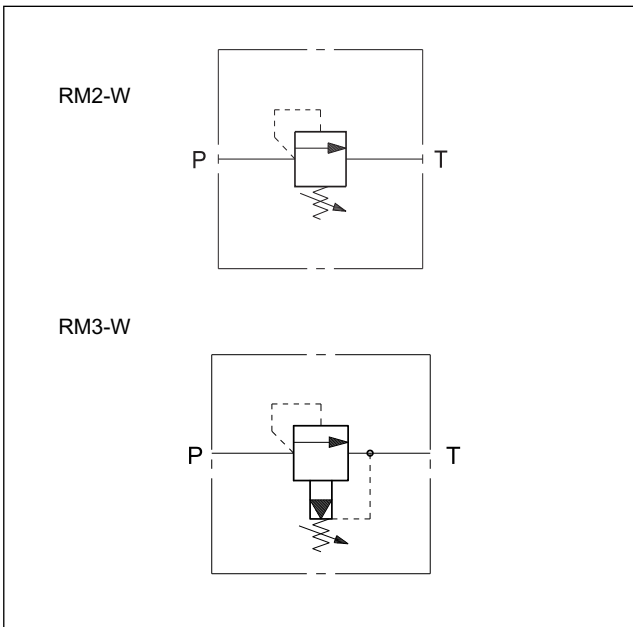
PRESSURE CONTROL VALVES

RM2-W SERIES 31
RM3-W SERIES 30

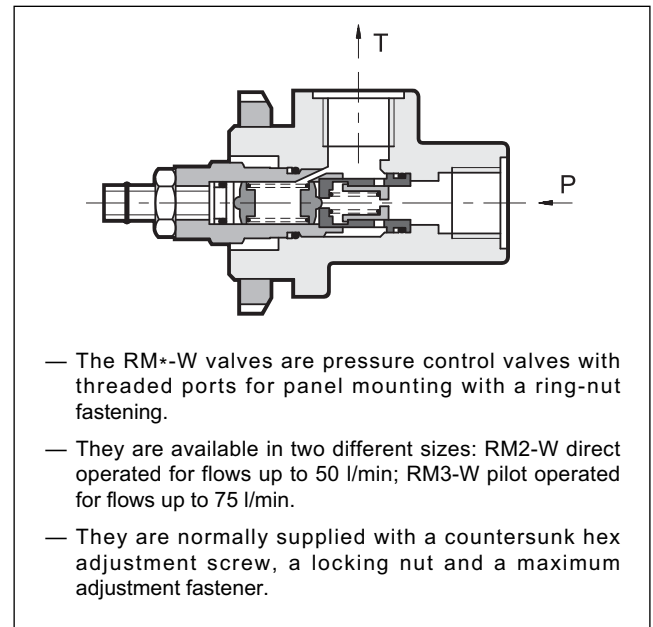
THREADED PORTS

p max 350 bar
Q max (see table of performances)

HYDRAULIC SYMBOLS



OPERATING PRINCIPLE



PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RM2-W	RM3-W
Maximum operating pressure	bar	350	
Minimum controlled pressure		see diagram	
Maximum flow rate	l/min	50	75
Ambient temperature range	°C	-20 / +60	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 ÷ 400	
Fluid contamination degree		according to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25	
Mass	kg	0,9	

1 - IDENTIFICATION CODE

R	M		-	W	/														
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Example: RM2-W3/31N/K
RM3-W3/M1/30/V

Pressure control valve

Nominal dimension: _____
2 = 3/8" 3 = 1/2"

Threaded ports BSP _____

Pressure adjustment range: _____
3 = up to 70 bar 5 = up to 210 bar
4 = up to 140 bar 6 = up to 350 bar

only for RM2: /K = Adjustment knob
(omit for adjustment with countersunk hex screw)

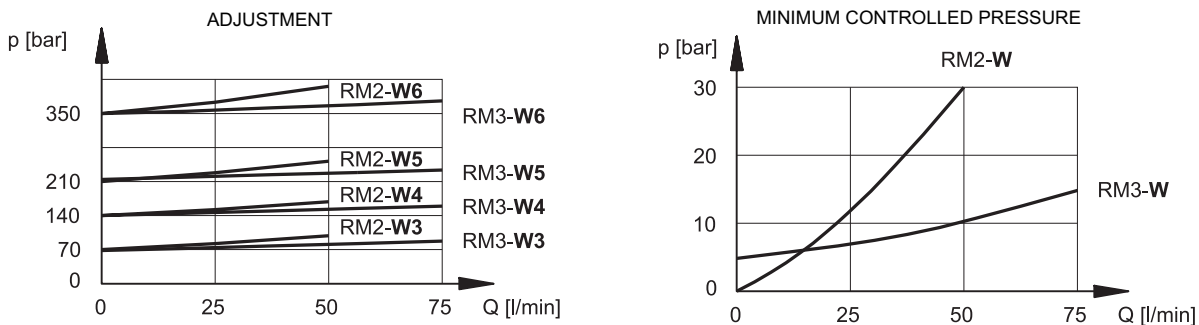
only for RM3: Seals
Omit for NBR seals for mineral oils (**standard**)
V = FPM seals for special fluids

Series no: 31 for RM2-W 30 for RM3-W

only for RM2: Seals
N = NBR seals for mineral oils (**standard**)
V = FPM seals for special fluids

only for RM3: M1 = Adjustment knob (omit for adjustment with countersunk hex screw)

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

①	Countersunk hex adjustment screw: RM2-W: spanner 6 RM3-W: spanner 5 Clockwise rotation to increase pressure
②	Locking nut: RM2-W: spanner 19 RM3-W: spanner 17
③	Ring-nut for flange mounting type SKF KM9
④	Outlet port 1/2" BSP
⑤	Pressure port: RM2-W: 3/8" BSP RM3-W: 1/2" BSP
⑥	Adjustment knob: RM3-W: M1
⑦	Adjustment knob: RM2-W: K
⑧	Locking ring



RQ*-W

PRESSURE RELIEF VALVE

SERIES 41

THREADED PORTS

p max 350 bar

Q max (see table of performances)

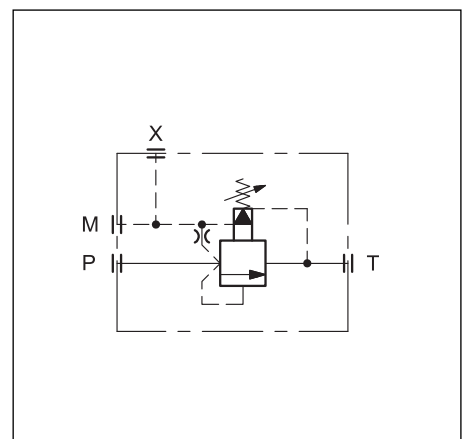
OPERATING PRINCIPLE

- The RQ*-W valves are pilot operated pressure relief valves with threaded ports, available in two nominal sizes for a flow rate up to 400 l/min.
- Main stage with shutter and cone seal.
- Possibility of remote piloting using port X (see par. 4).
- The valves allow the use of the entire flow of the pump even with pressure values near the set value. The wide passages allow reduced pressure drops and fluid heating due to low pressure drop across the valve.
- They are normally supplied with a hexagonal head adjustment screw. Upon request, they can be equipped with a SICBLOC adjustment knob.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQ5-W	RQ7-W
Maximum operating pressure	bar	350	
Maximum flow rate	l/min	250	400
Ambient temperature range	°C	-20 / +60	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 ÷ 400	
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15		
Recommended viscosity	cSt	25	
Mass	kg	4,1	8

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

	R	Q	-	W	/	/	41	/	
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Pressure control valve _____

Nominal dimension **5** = DN 25
7 = DN 40

BSP threaded ports _____

Pressure adjustment range: _____

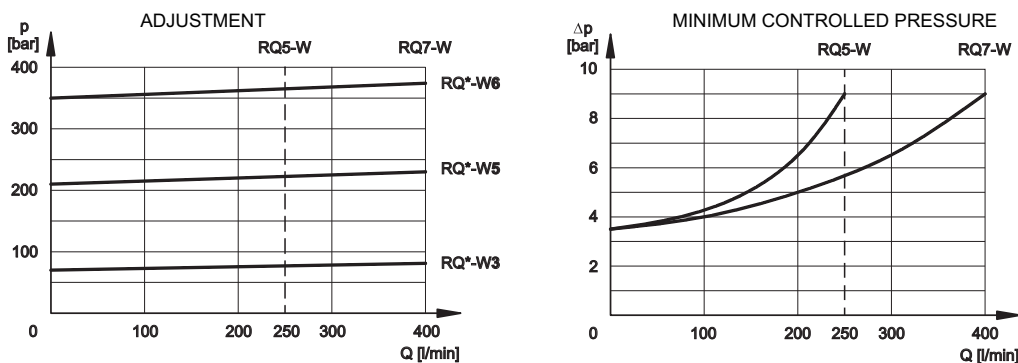
3 = up to 70 bar
5 = up to 210 bar
6 = up to 350 bar

Seals:
omit for mineral oils
V = viton for special fluids

Series No. (the overall and mounting dimensions remain unchanged from 40 to 49)

M = adjustment with SICBLOC knob
(omit for adjustment with hexagonal head screw)

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

1	Hexagonal head adjustment screw. Spanner 13. Clockwise rotation to increase pressure
2	Remote piloting port X: 1/4" BSP
3	Outlet port T RQ5-W: 1" BSP RQ7-W: 1" 1/2 BSP
4	Pressure port P RQ5-W: 3/4" BSP RQ7-W: 1" 1/4 BSP
5	Pressure gauge port 3/8" BSP
6	SICBLOC adjustment knob. To operate, push and rotate at the same time.

	A	B	C	D	ØE	F	G	H	I	L	M	ØN	ØO
RQ5-W	168	98	49	4	22	21.5	44.5	123	80	87	53	35.5	46
RQ7-W	168	98	49	4	22	43	59.5	145	102	109	68	50	56



RQM*-W

SOLENOID OPERATED PRESSURE RELIEF VALVE WITH UNLOADING AND PRESSURE SELECTION

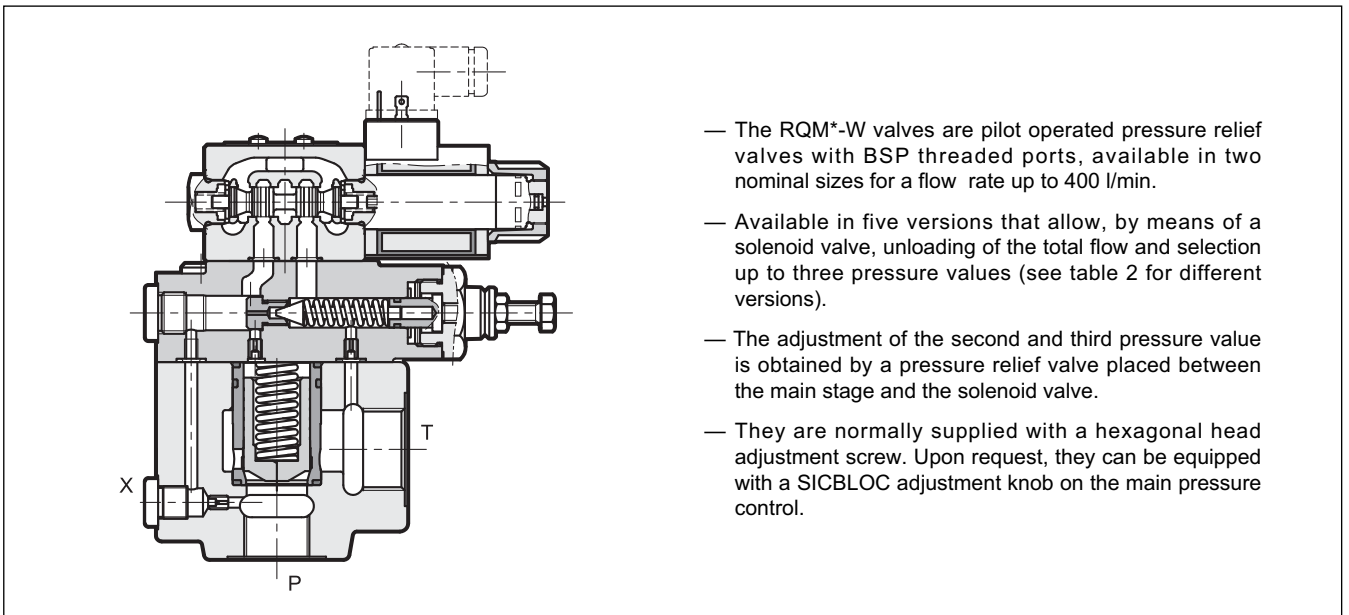
SERIES 60

THREADED PORTS

p max **350** bar

Q max (see table of performances)

OPERATING PRINCIPLE



- The RQM*-W valves are pilot operated pressure relief valves with BSP threaded ports, available in two nominal sizes for a flow rate up to 400 l/min.
- Available in five versions that allow, by means of a solenoid valve, unloading of the total flow and selection up to three pressure values (see table 2 for different versions).
- The adjustment of the second and third pressure value is obtained by a pressure relief valve placed between the main stage and the solenoid valve.
- They are normally supplied with a hexagonal head adjustment screw. Upon request, they can be equipped with a SICBLOC adjustment knob on the main pressure control.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQM5-W	RQM7-W
Maximum operating pressure	bar	350	
Maximum flow rate	l/min	250	400
Ambient temperature range	°C	-20 / +50	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 + 400	
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15		
Recommended viscosity	cSt	25	

NOTE: for the solenoid valve DS3 characteristics see catalogue 41 150

1 - IDENTIFICATION CODE

R	Q	M	-	W	/	/	/	60	-	K1	/	
----------	----------	----------	----------	----------	---	---	---	-----------	----------	-----------	---	--

Pressure relief valve pilot operated

solenoid valve for venting / pressure selection

Nominal dimension: **5** = ND 25
7 = ND 40

BSP threaded ports

Pressure adjustment range:
3 = up to 70 bar **6** = up to 350 bar
5 = up to 210 bar

Versions: **A**
B
C
D
G } see description in table 2 versions

M = adjustment with SICBLOC knob available on the main pressure control (omit for adjustment with hexagonal head screw)

Series No. (the overall and mounting dimensions remain unchanged from 60 to 69)

NOTE: The locking rings of the coils and the relevant O-Rings are supplied together with valves

Manual override: omit for override integrated in the tube (**standard**)
CM = manual override, boot protected

Coil electrical connection: plug for connector type DIN 43650 (**standard**)

DC power supply

D12 = 12 V
D24 = 24 V
D48 = 48 V
D110 = 110 V
D220 = 220 V
D00 = valve without coils (see **NOTE**)

AC power supply

A24 = 24 V - 50 Hz
A48 = 48 V - 50 Hz
A110 = 110 V - 50 Hz / 120 V - 60 Hz
A230 = 230 V - 50 Hz / 240 V - 60 Hz
A00 = valve without coils (see **NOTE**)

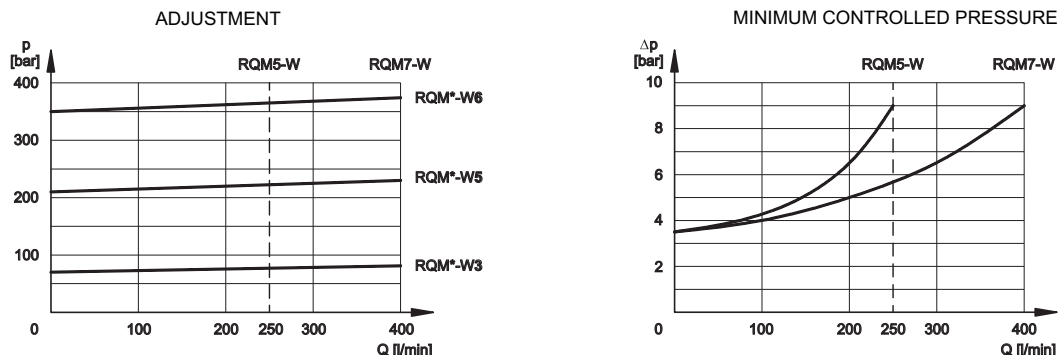
F110 = 110 V - 60 Hz
F220 = 220 V - 60 Hz

Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

2 - VERSIONS

RQM*-W*/A	RQM*-W*/B	RQM*-W*/C	RQM*-W*/D	RQM*-W*/G
<p>1 pressure setting and unloading with de-energized solenoid</p>	<p>1 pressure setting and unloading with energized solenoid</p>	<p>2 pressure settings The highest setting is reached with energized solenoid</p>	<p>2 pressure settings and unloading with de-energized solenoids</p>	<p>3 pressure settings The highest setting is reached with de-energized solenoids</p>

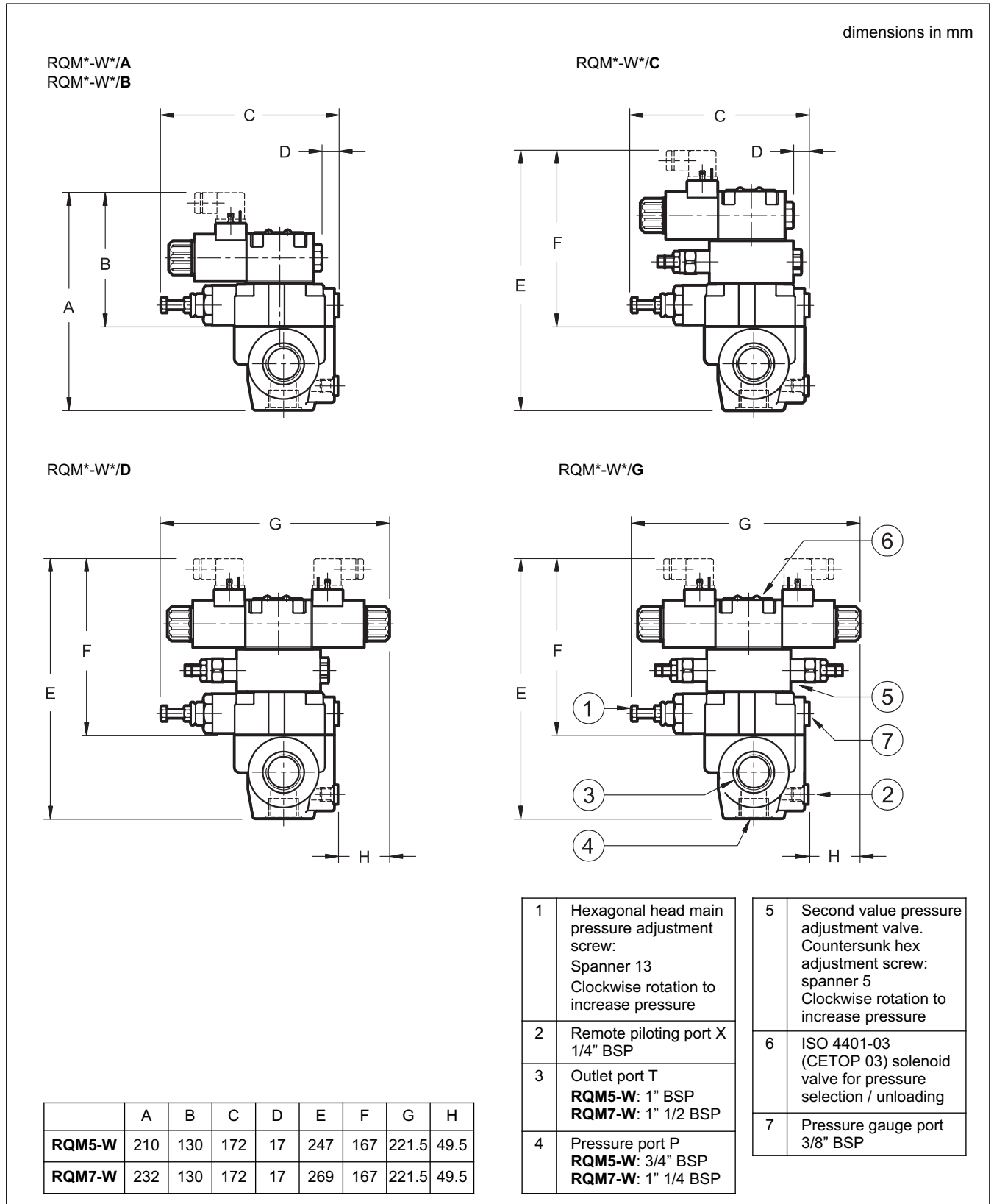
3 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



4 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

5 - OVERALL AND MOUNTING DIMENSIONS

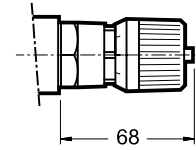




6 - ADJUSTMENT KNOB

The RQ valves can be equipped with a SICBLOC adjustment knob, only on the main pressure regulation. To operate it, push and rotate at the same time.

Add **/M** to request this option (see paragraph 1).



7 - ELECTRIC CONNECTORS

Solenoid operated valves are delivered without connectors. They must be ordered separately.

For the identification of the connector type to be ordered, please see catalogue 49 000.

8 - MANUAL OVERRIDE, BOOT PROTECTED: CM

Whenever the solenoid valve installation may involve exposure to atmospheric agents or utilization in tropical climates, the use of the boot protected manual override is recommended.

Add the suffix **CM** to request this device (see paragraph 1).

For overall dimensions see catalogue 41 150.



RQ*-P

PRESSURE RELIEF VALVES

SERIES 41

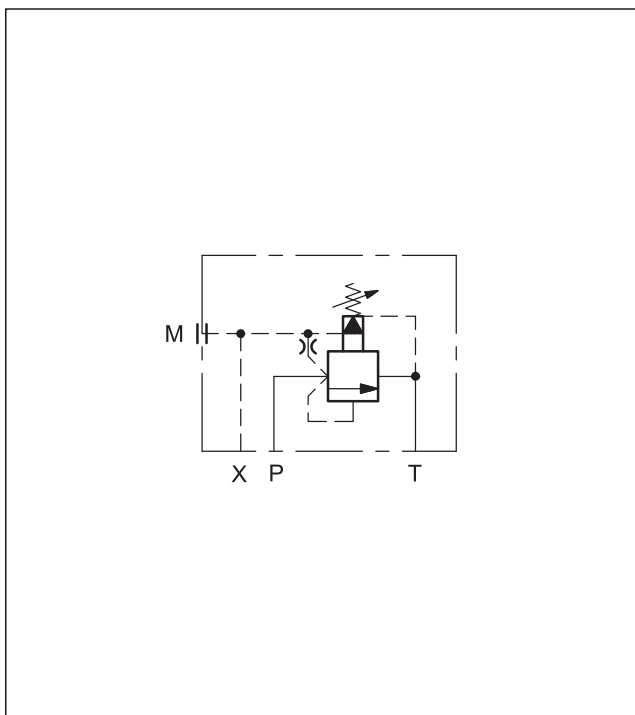
SUBPLATE MOUNTING

RQ3-P ISO 6264-06

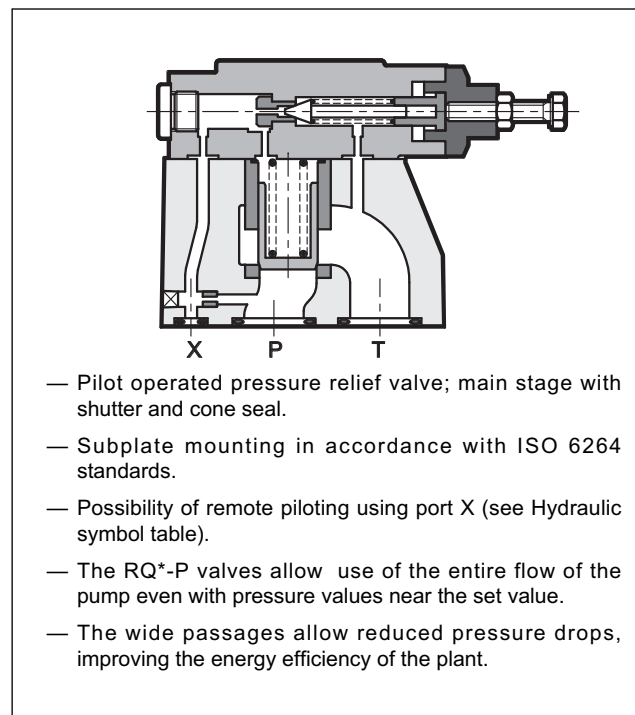
RQ5-P ISO 6264-08

RQ7-P ISO 6264-10

HYDRAULIC SYMBOL



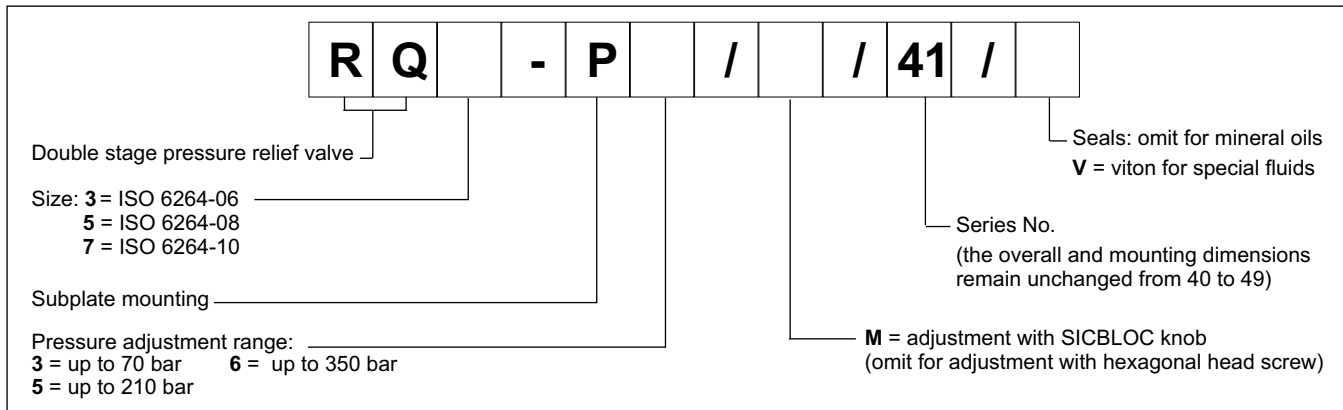
OPERATING PRINCIPLE



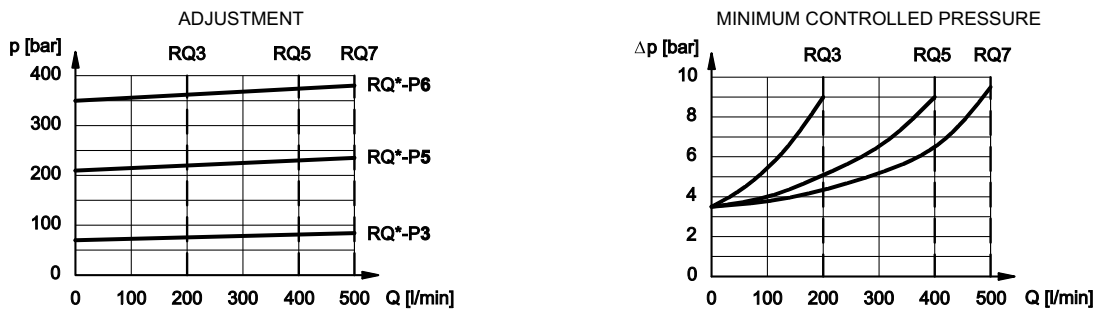
PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQ3-P	RQ5-P	RQ7-P
Maximum operating pressure	bar	350		
Maximum flow rate	l/min	200	400	500
Ambient temperature range	°C	-20 / +60		
Fluid temperature range	°C	-20 / +80		
Fluid viscosity range	cSt	10 ÷ 400		
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15			
Recommended viscosity	cSt	25		
Mass	kg	3,5	4,3	6,5

1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

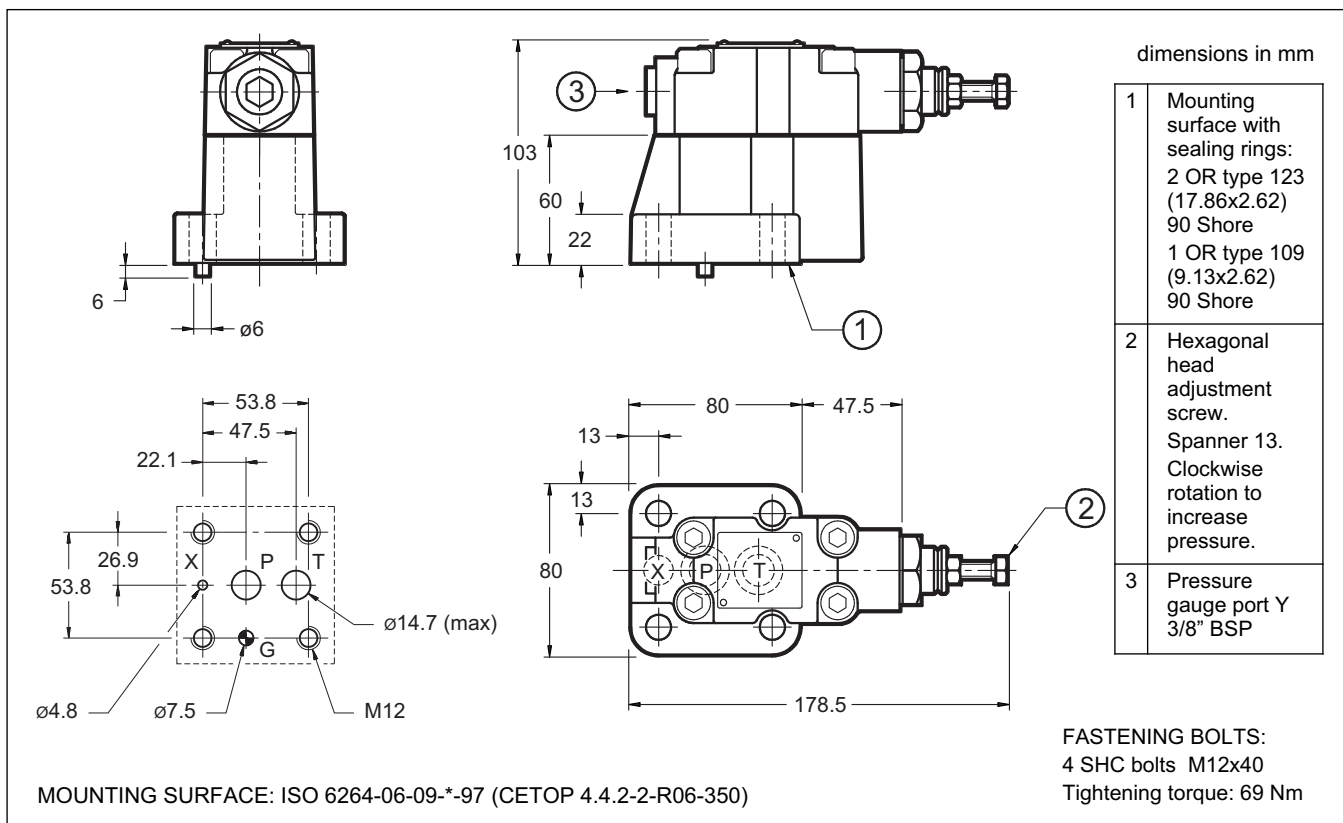


3 - HYDRAULIC FLUIDS

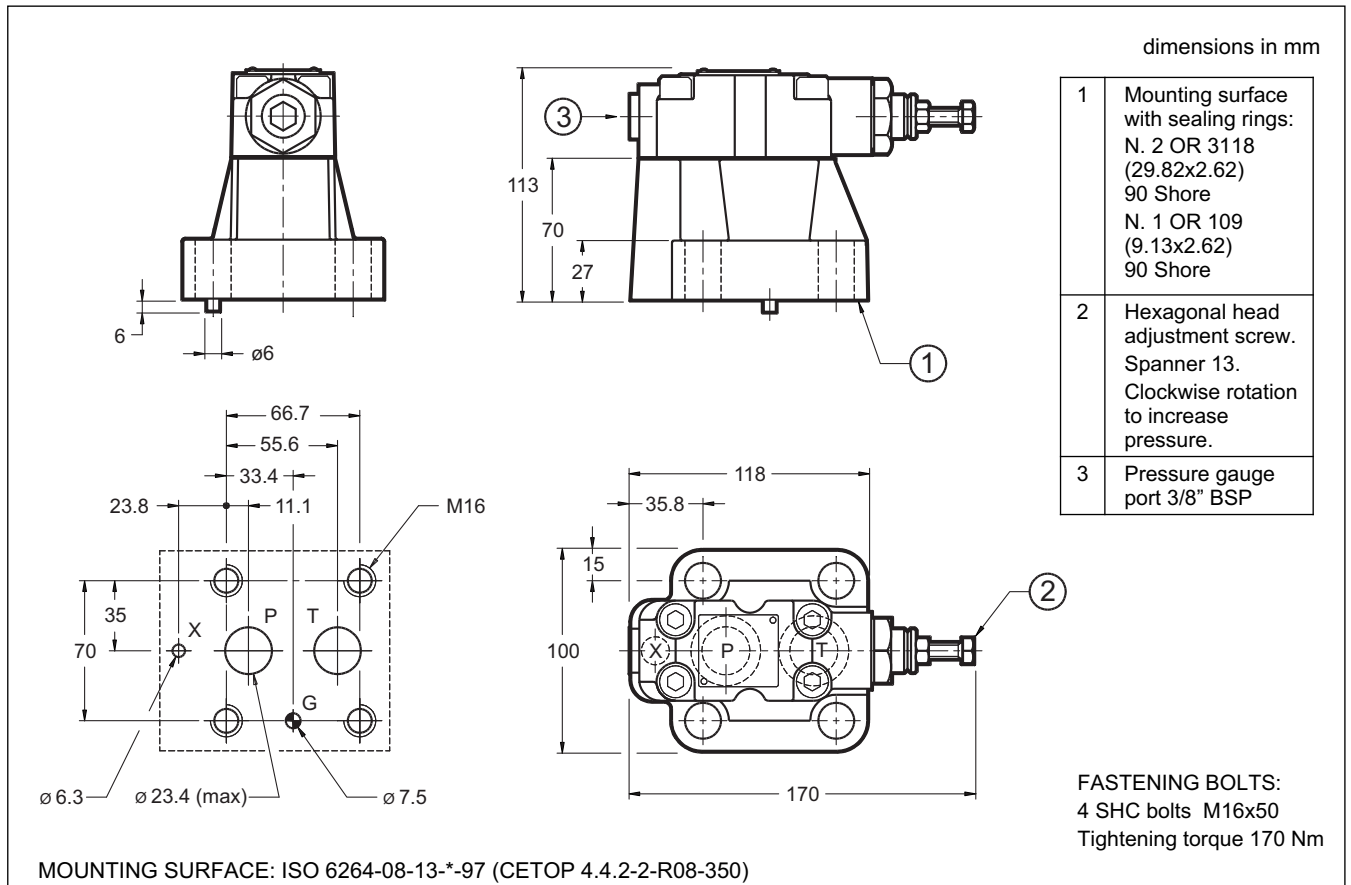
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

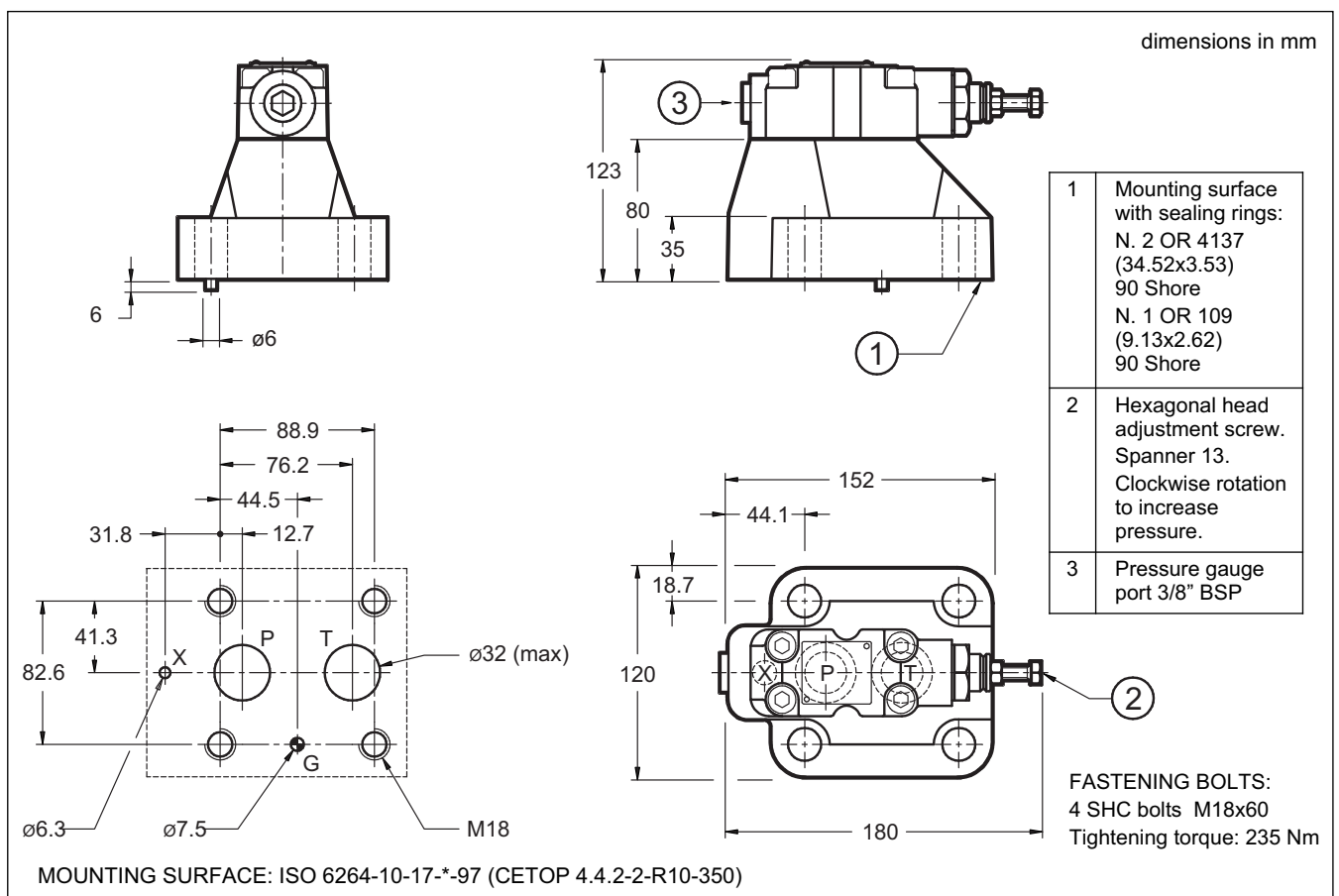
4 - RQ3-P OVERALL AND MOUNTING DIMENSIONS



5 - RQ5-P OVERALL AND MOUNTING DIMENSIONS



6 - RQ7-P OVERALL AND MOUNTING DIMENSIONS

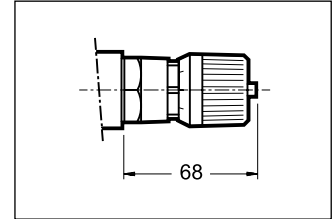




7 - ADJUSTMENT KNOB

The RQ valves can be equipped with a SICBLOC adjustment knob. To operate it, push and rotate at the same time.

To request this option, add: /M (see paragraph 1).



8 - SUBPLATES (see catalogue 51 000)

	RQ3-P	RQ5-P	RQ7-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports
P, T ports dimension	P: 1/2" BSP T: 3/4" BSP	1" BSP	1" 1/4 BSP
X port dimension	1/4" BSP	1/4" BSP	1/4" BSP



RQM*-P

SOLENOID OPERATED PRESSURE RELIEF VALVES WITH UNLOADING AND PRESSURE SELECTION

SERIES 60

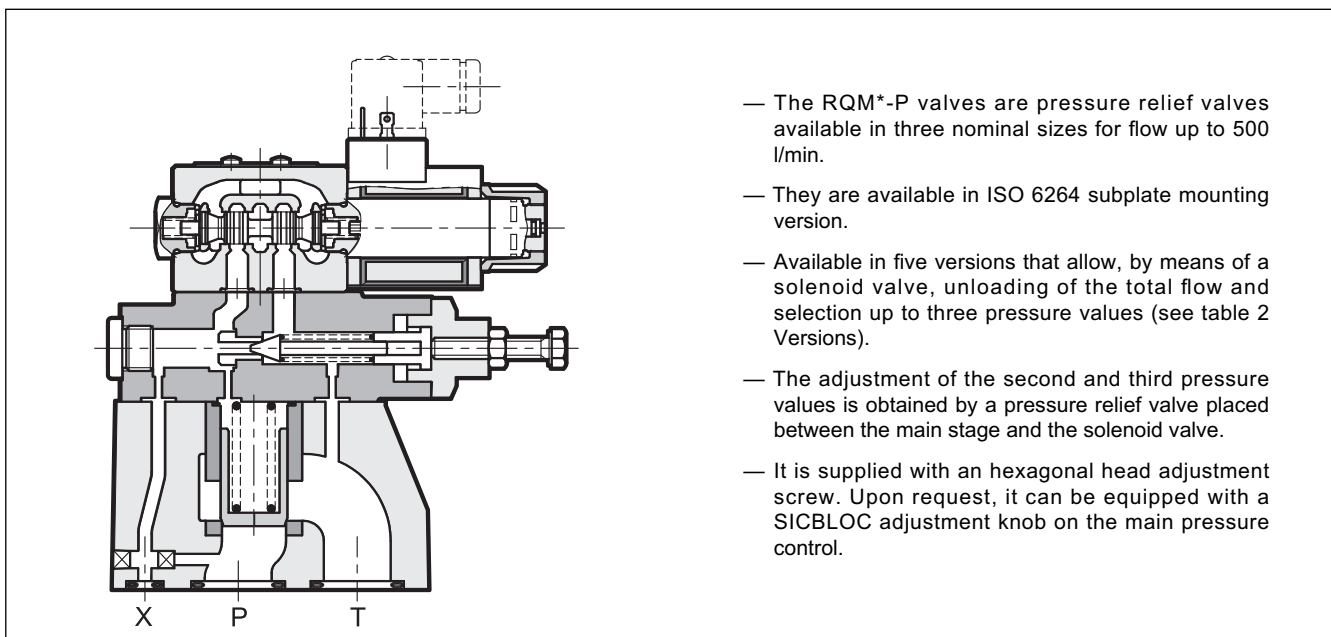
SUBPLATE MOUNTING

RQM3-P ISO 6264-06

RQM5-P ISO 6264-08

RQM7-P ISO 6264-10

OPERATING PRINCIPLE



- The RQM*-P valves are pressure relief valves available in three nominal sizes for flow up to 500 l/min.
- They are available in ISO 6264 subplate mounting version.
- Available in five versions that allow, by means of a solenoid valve, unloading of the total flow and selection up to three pressure values (see table 2 Versions).
- The adjustment of the second and third pressure values is obtained by a pressure relief valve placed between the main stage and the solenoid valve.
- It is supplied with an hexagonal head adjustment screw. Upon request, it can be equipped with a SICBLOC adjustment knob on the main pressure control.

PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		RQM3-P	RQM5-P	RQM7-P
Maximum operating pressure	bar	350		
Maximum flow rate	l/min	200	400	500
Ambient temperature range	°C	-20 / +50		
Fluid temperature range	°C	-20 / +80		
Fluid viscosity range	cSt	10 + 400		
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15			
Recommended viscosity	cSt	25		

NOTE: for the solenoid valve DS3 characteristics see catalogue 41 150

1 - IDENTIFICATION CODE

R	Q	M	- P	/	/	/ 60	-	K1	/
----------	----------	----------	------------	----------	----------	-------------	----------	-----------	----------

pilot operated pressure relief valve
solenoid valve for unloading / pressure selection

Size: **3** = ISO 6264-06
5 = ISO 6264-08
7 = ISO 6264-10

Subplate mounting

Pressure adjustment range:
3 = up to 70 bar **6** = up to 350 bar
5 = up to 210 bar

Versions: **A** }
B } see description
C } in hydraulic symbols
D } table
G }

M = adjustment with SICBLOC knob available only on the main pressure control (Omit for adjustment with hexagonal head screw)

Series No. (the overall and mounting dimensions remain unchanged from 60 to 69)

NOTE: The locking rings of the coils and the relevant O-Rings are supplied together with valves

Manual override: omit for override integrated in the tube (**standard**)
CM = manual override, boot protected

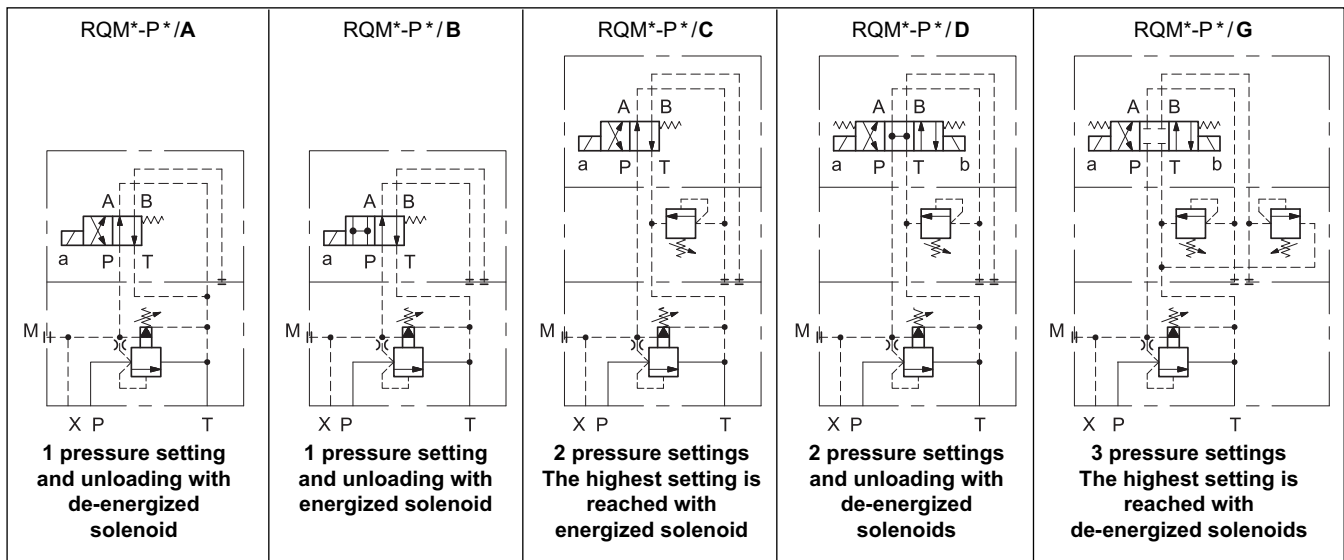
Coil electrical connection: plug for connector type EN 175301-803 (ex DIN 43650) (**standard**)

DC power supply
D12 = 12 V
D24 = 24 V
D48 = 48 V
D110 = 110 V
D220 = 220 V
D00 = valve without coils (see **NOTE**)

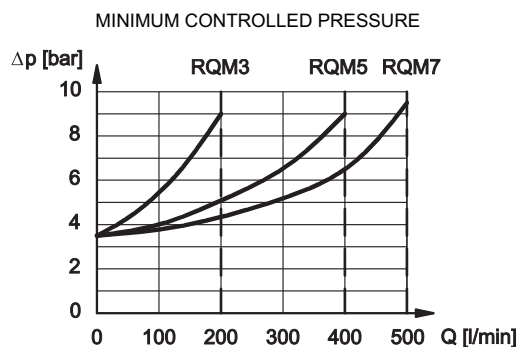
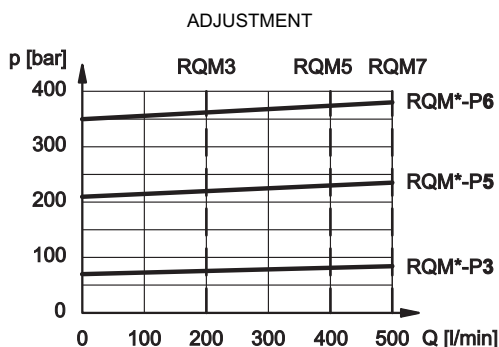
AC power supply
A24 = 24 V - 50 Hz
A48 = 48 V - 50 Hz
A110 = 110 V - 50 Hz / 120 V - 60 Hz
A230 = 230 V - 50 Hz / 240 V - 60 Hz
A00 = valve without coils (see **NOTE**)
F110 = 110 V - 60 Hz
F220 = 220 V - 60 Hz

Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

2 - VERSIONS



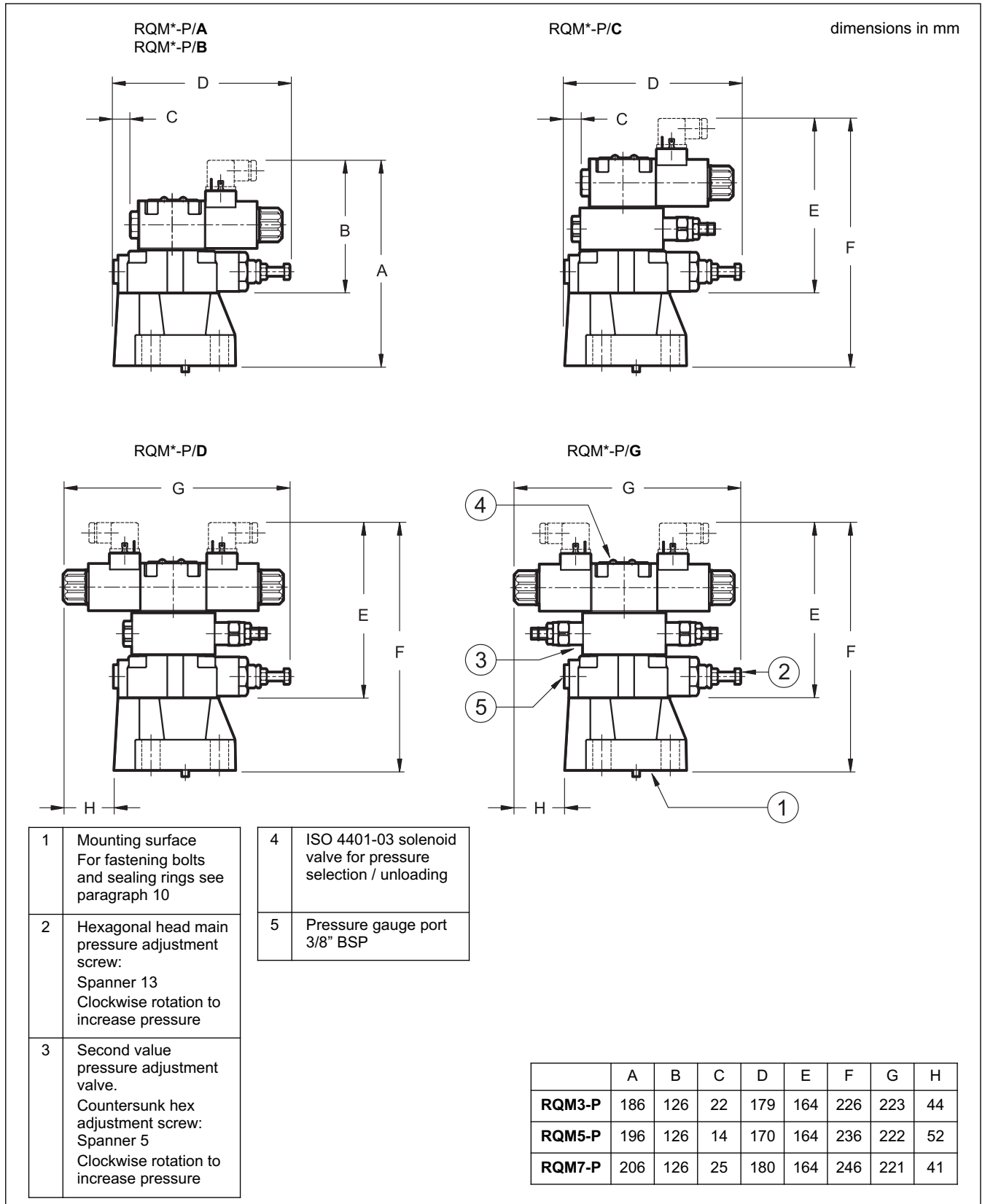
3 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



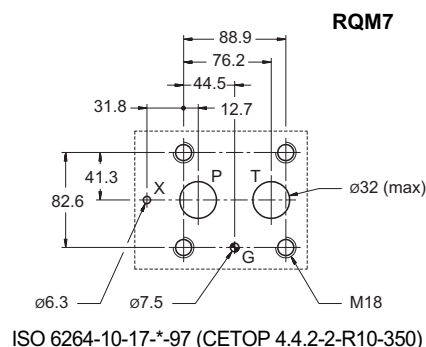
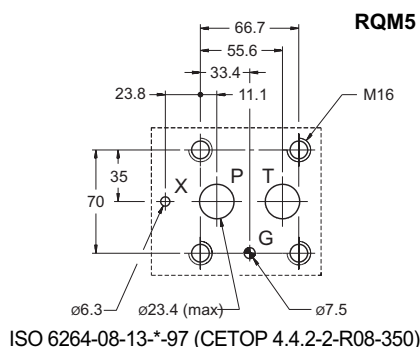
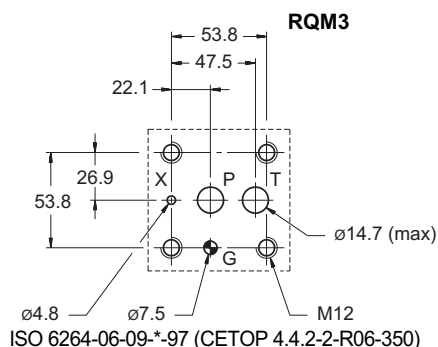
4 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

5 - OVERALL AND MOUNTING DIMENSIONS



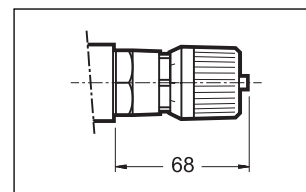
6 - MOUNTING SURFACES



7 - ADJUSTMENT KNOB

The valves can be equipped with a SICBLOC adjustment knob, only on the main pressure regulation. To operate it, push and rotate at the same time.

To request this option, add: **/M** (see paragraph 1).



8 - ELECTRIC CONNECTORS

Solenoid operated valves are delivered without connectors. Connectors type EN 175301-803 (ex DIN 43650) for K1 connections can be ordered separately. See catalogue 49 000.

9 - MANUAL OVERRIDE, BOOT PROTECTED: CM

Whenever the solenoid valve installation may involve exposure to atmospheric agents or utilization in tropical climates, the use of the boot protected manual override is recommended.

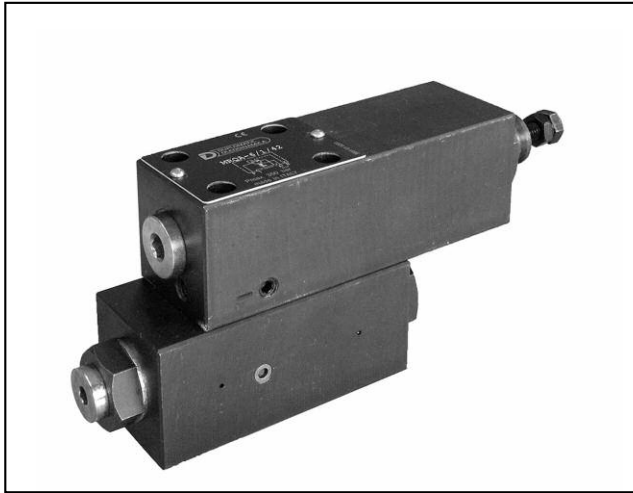
Add the suffix **CM** to request this device (see paragraph 1). For overall dimensions see catalogue 41 150.

10 - FASTENING BOLTS AND SEALING RINGS

	RQM3-P	RQM5-P	RQM7-P
Fastening (4 SHC bolts ISO 4762)	M12 x 40	M16 x 50	M18 x 60
Torque	69 Nm	170 Nm	235 Nm
Sealing rings	N. 2 OR type 123 (17.86x2.62) 90 Shore N. 1 OR type 109 (9.13x2.62) 90 Shore	N. 2 OR type 3118 (29.82x2.62) 90 Shore N. 1 OR type 109 (9.13x2.62) 90 Shore	N. 2 OR type 4137 (34.52x3.53) 90 Shore N. 1 OR type 109 (9.13x2.62) 90 Shore

11 - SUBPLATES (see catalogue 51 000)

	RQM3-P	RQM5-P	RQM7-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports
P, T ports dimension	P: 1/2" BSP T: 3/4" BSP	1" BSP	1" 1/4 BSP
X port dimension	1/4" BSP	1/4" BSP	1/4" BSP



MRQA

UNLOADING VALVE

(FOR CIRCUITS WITH ACCUMULATOR)

SERIES 42

SUBPLATE MOUNTING

ISO 4401-03

p max 350 bar
Q max 40 l/min

OPERATING PRINCIPLE

— MRQA is a pressure relief and safety valve with automatic unloading. Upon reaching the set value, the valve freely unloads the pump and puts it under pressure again when the pressure values descend in the circuit to correspond to 63% or 75% of the set value.

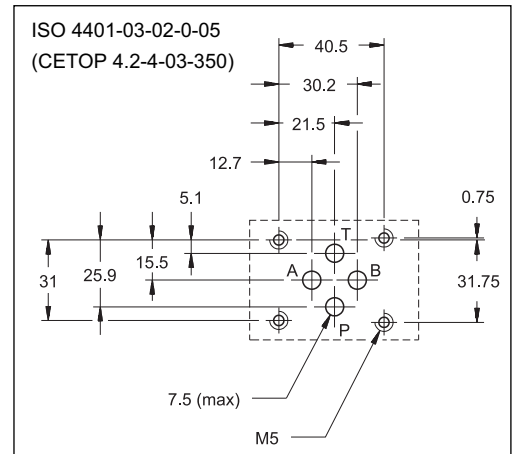
In order to assure this operation, it is necessary to use an accumulator (see hydraulic diagram) that guarantees pressure maintenance in the circuit. A check valve, incorporated in the panel or available as a plate under the valve MRQA/C, prevents the accumulator unloading through the open valve.

This system maintains the pressure in the hydraulic circuit, avoiding heating of the oil and reducing energy consumption.

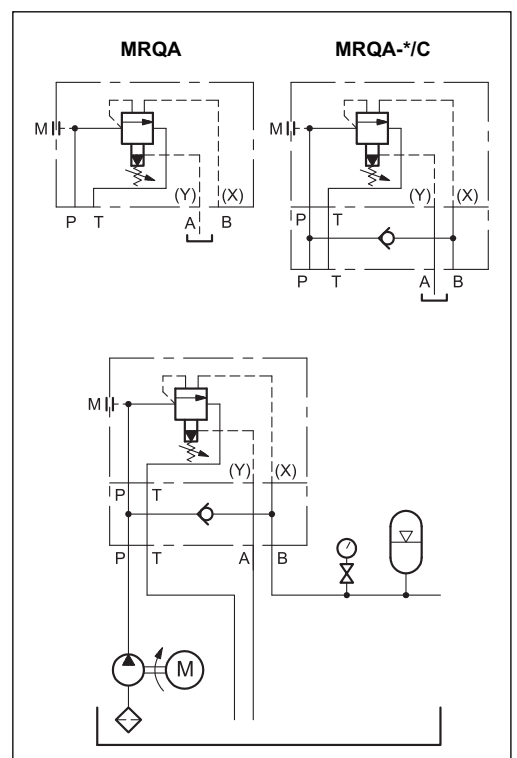
It is recommended to place the accumulator as close as possible to the MRQA, without reducing the connection size.

— The cycle time depends on the pump flow rate, the accumulator capacity and pre-charge, and the flow requirement of the system.

MOUNTING SURFACE



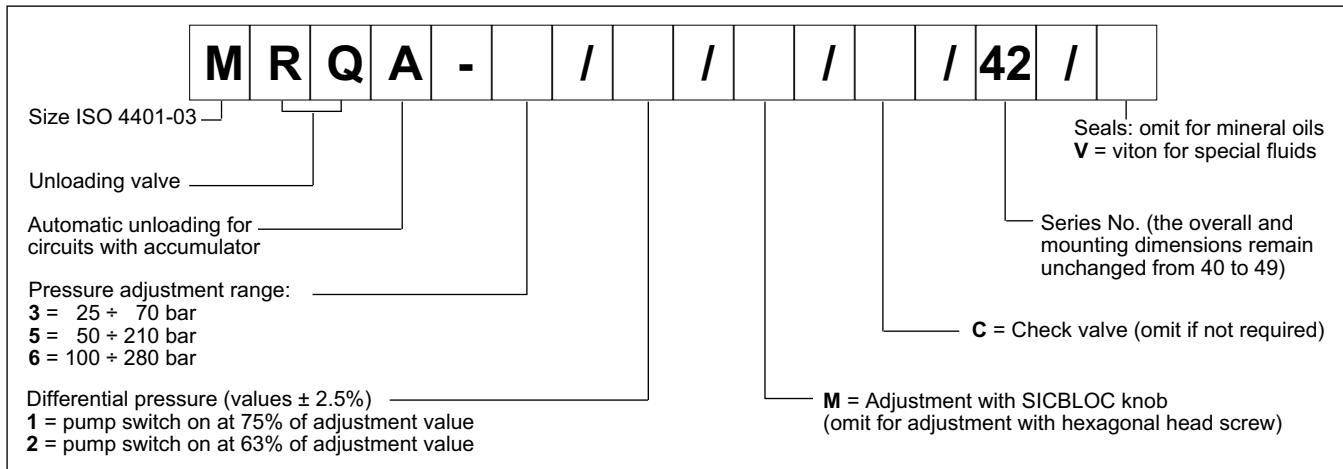
HYDRAULIC SYMBOLS & DIAGRAM



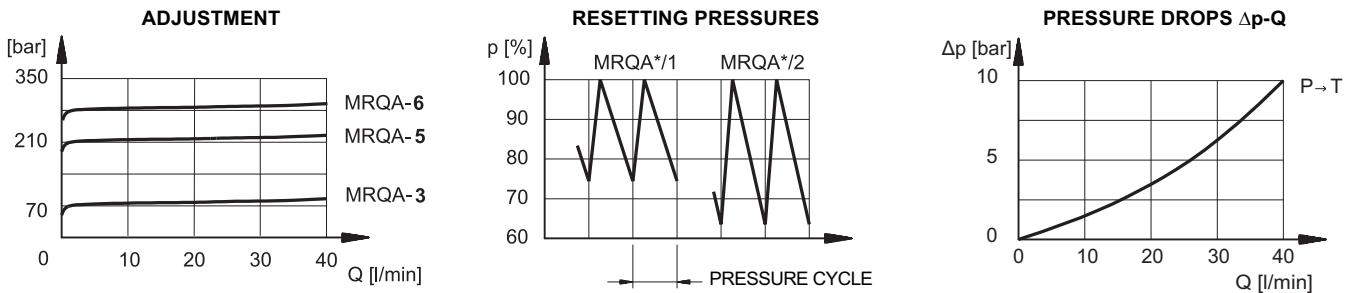
PERFORMANCE RATINGS (measured with mineral oil of viscosity 36 cSt at 50°C)

Maximum operating pressure	bar	350
Maximum flow rate	l/min	40
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 21/19/16	
Recommended viscosity	cSt	25
Mass: MRQA	kg	3,3
MRQA*/C		4,2

1 - IDENTIFICATION CODE



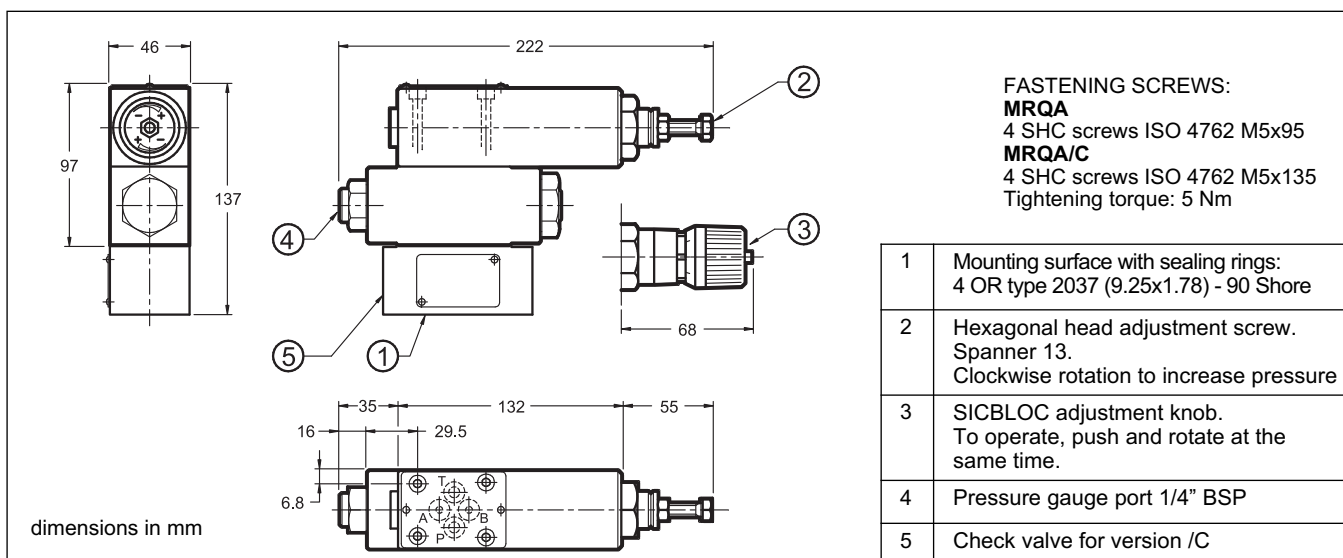
2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

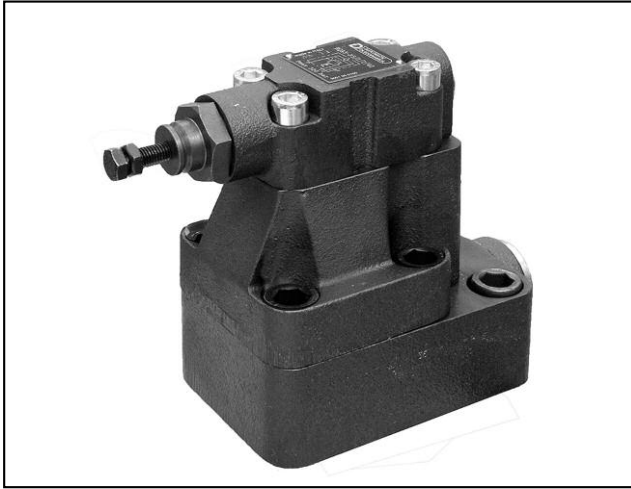


3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS





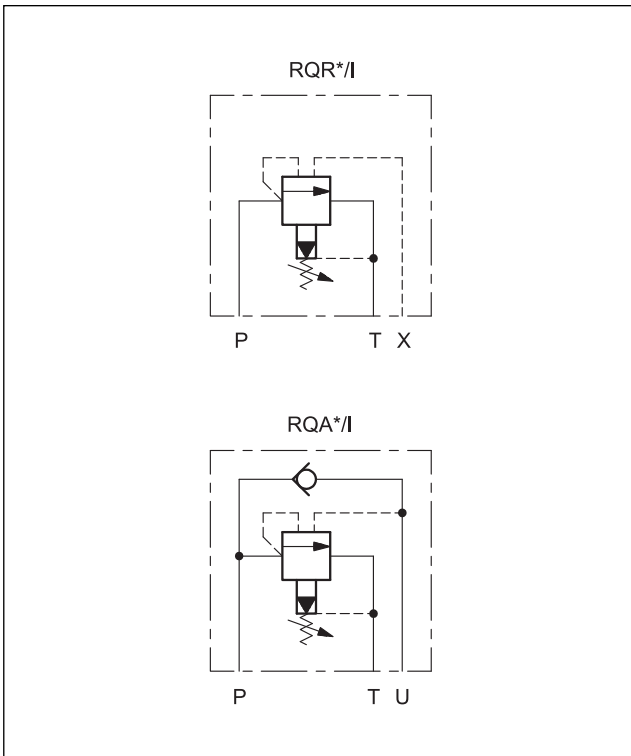
RQ-P**
UNLOADING VALVE
(FOR CIRCUITS WITH ACCUMULATOR)
SERIES 42

RQR*-P
FOR REMOTE PILOTING

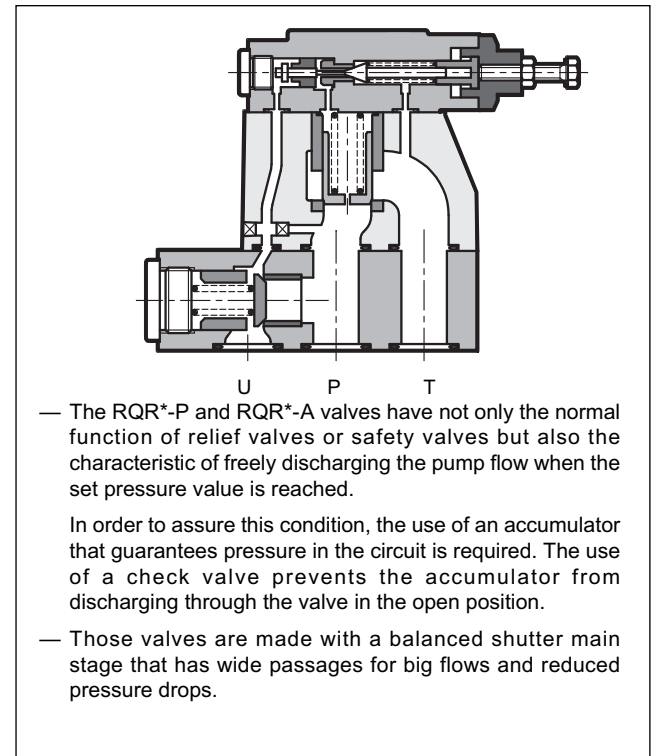
RQA*-P
WITH INCORPORATED CHECK VALVE

SUBPLATE MOUNTING

HYDRAULIC SYMBOLS



OPERATING PRINCIPLE

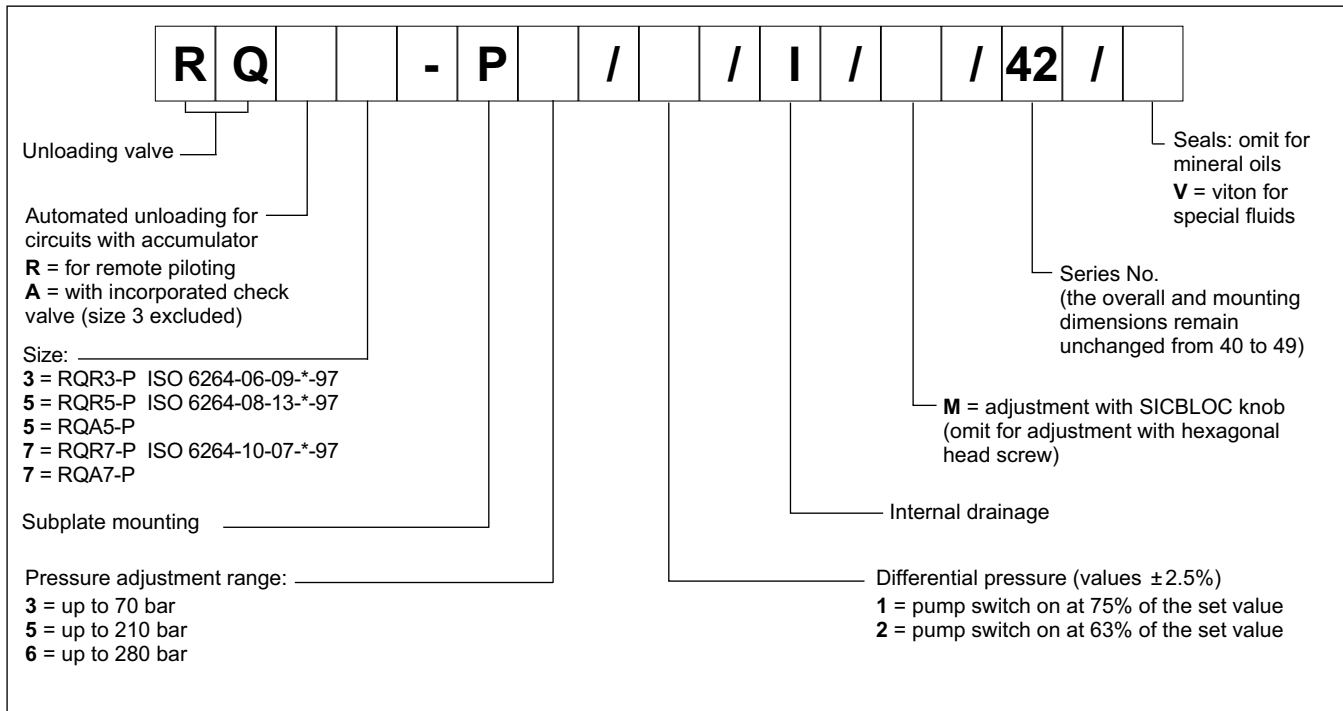


PERFORMANCES

(measured with mineral oil of viscosity 36 cSt at 50°C)

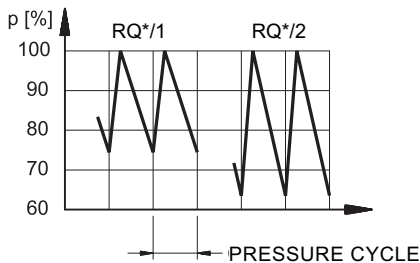
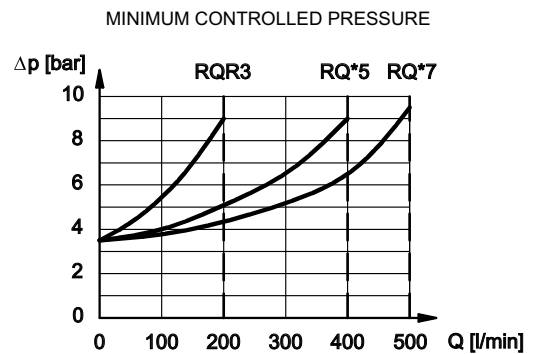
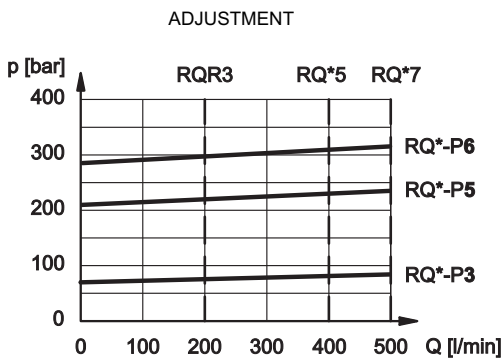
		RQR3-P	RQR5-P	RQR7-P	RQA5-P	RQA7-P
Maximum operating pressure	bar	350				
Maximum flow rate	l/min	200	400	500	400	500
Ambient temperature range	°C	-20 / +60				
Fluid temperature range	°C	-20 / +80				
Fluid viscosity range	cSt	10 ÷ 400				
Fluid contamination degree		According to ISO 4406:1999 class 20/18/15				
Recommended viscosity	cSt	25				
Mass	Kg	3,5	4,3	6,5	10	17

1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)

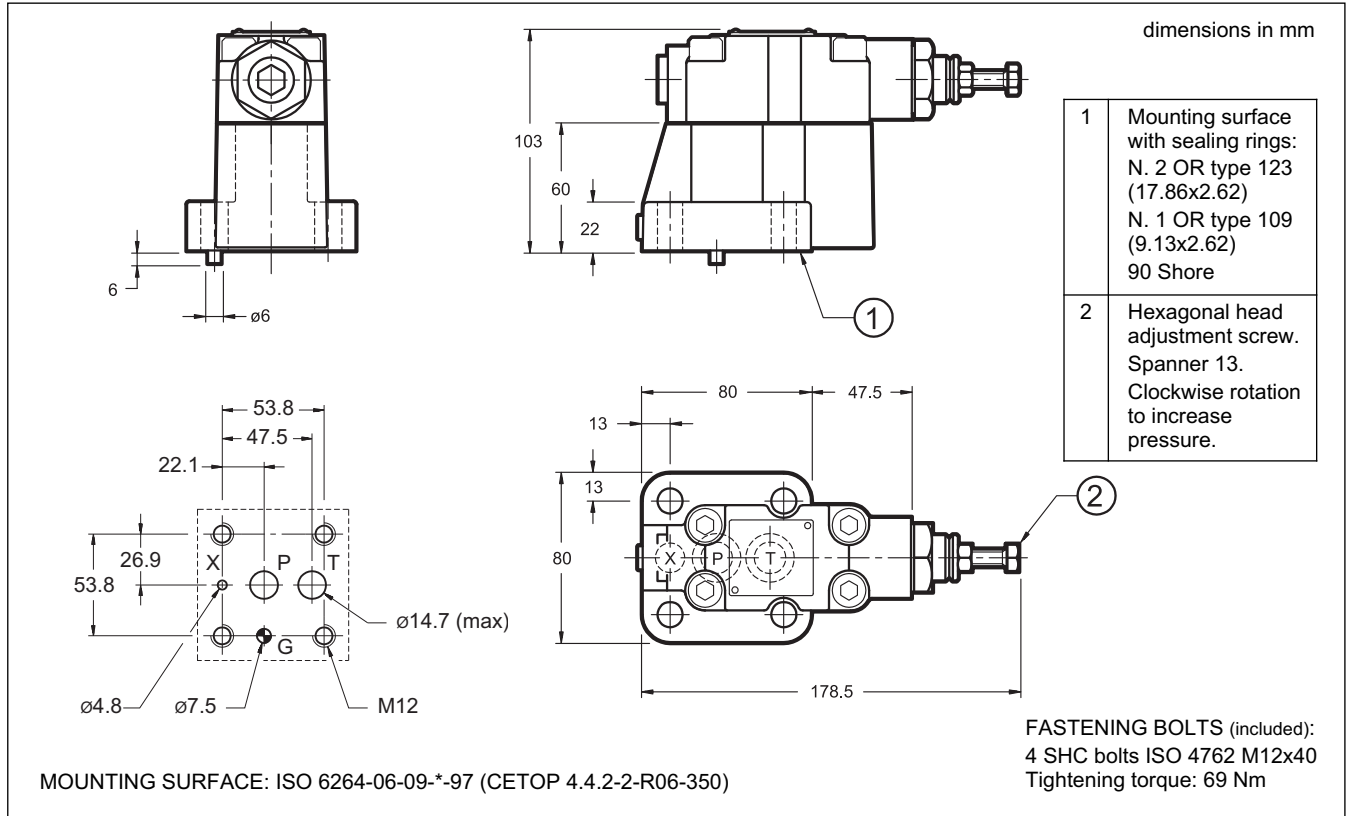


3 - HYDRAULIC FLUIDS

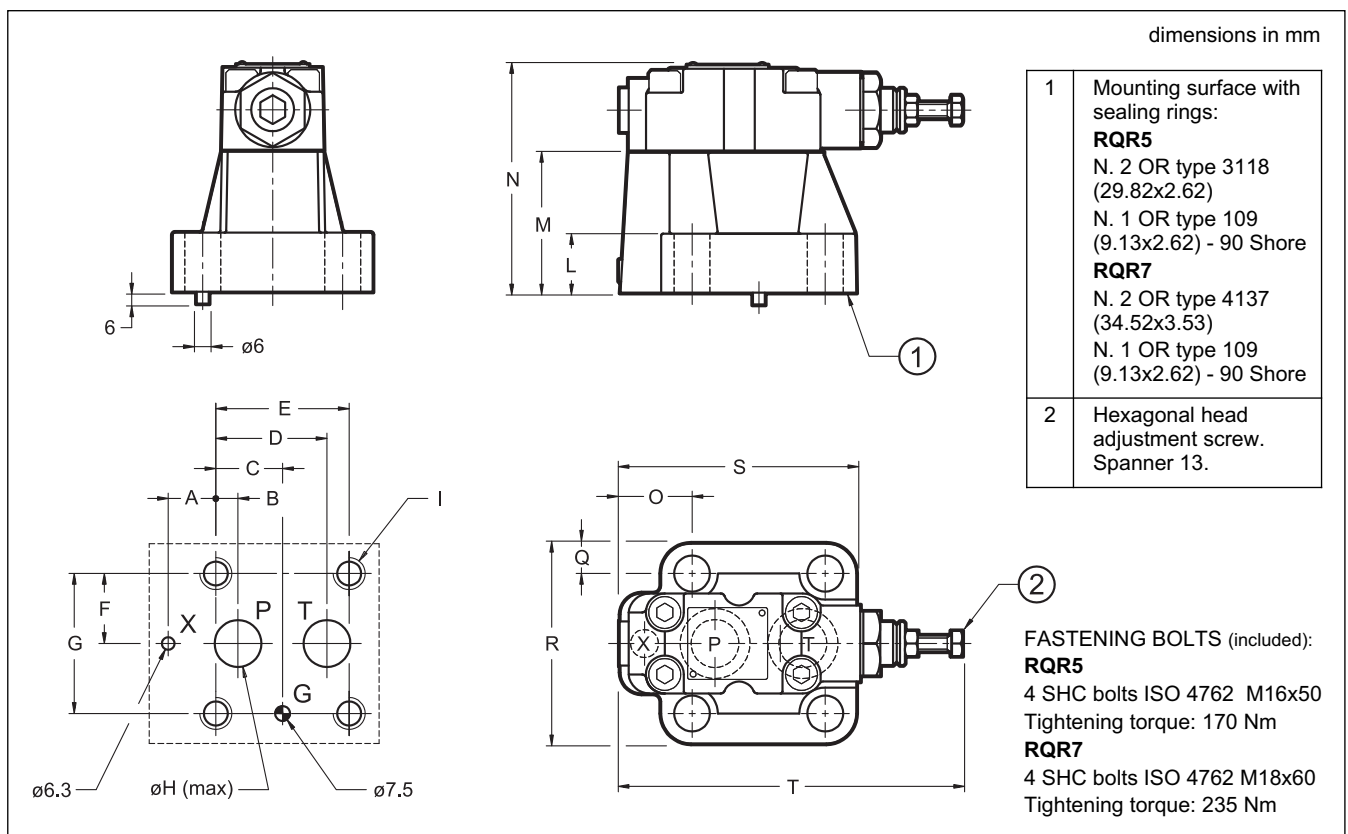
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - RQR3-P OVERALL AND MOUNTING DIMENSIONS

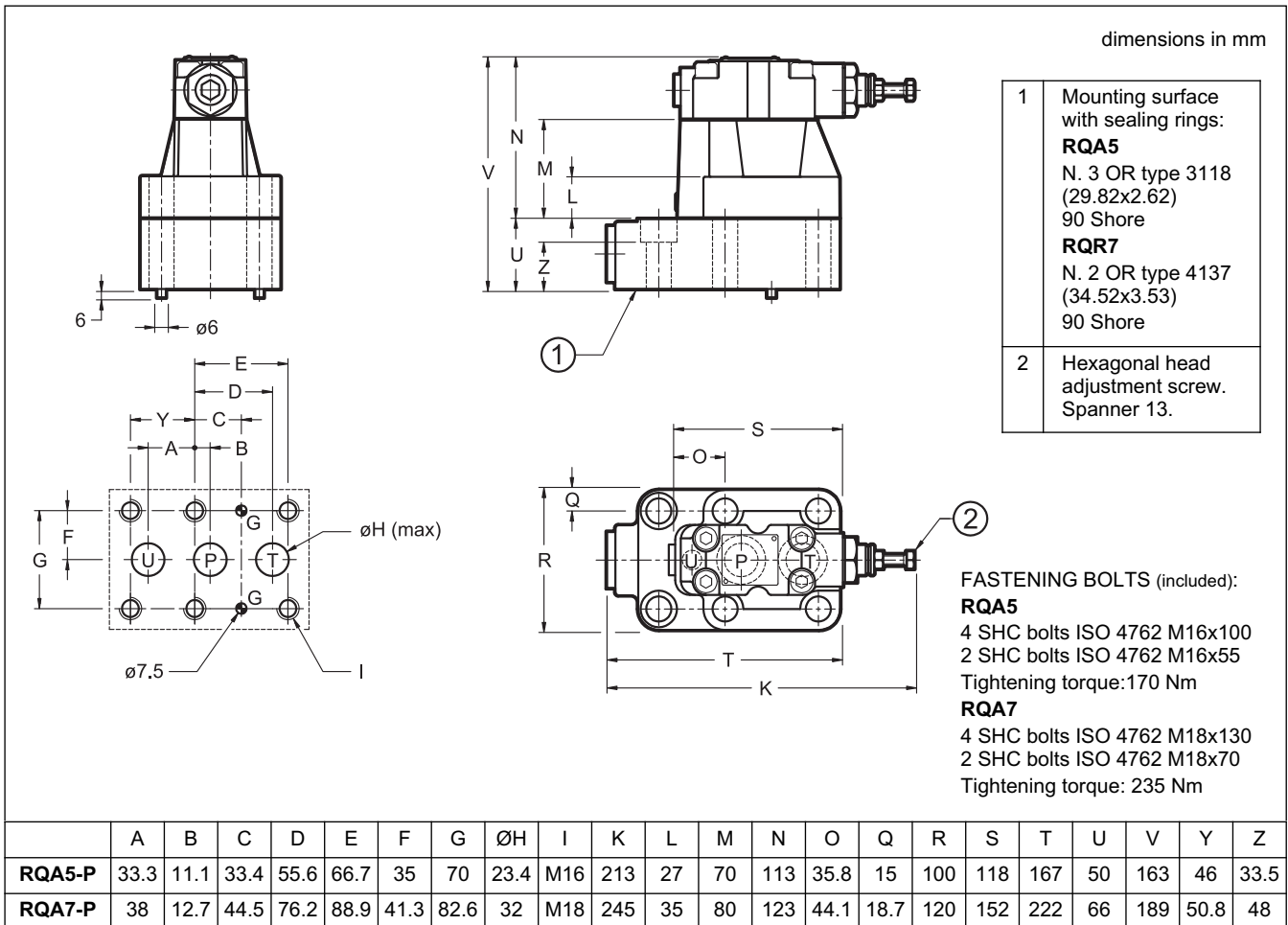


5 - RQR5-P AND RQR7-P OVERALL AND MOUNTING DIMENSIONS



	MOUNTING SURFACE	A	B	C	D	E	F	G	ØH	I	L	M	N	O	Q	R	S	T
RQR5-P	ISO 6264-08-13-*-97 (CETOP 4.4.2-2-R08-350)	23.8	11.1	33.4	55.6	66.7	35	70	23.4	M16	27	70	113	35.8	15	100	118	170
RQR7-P	ISO 6264-10-17-*-97 (CETOP 4.4.2-2-R10-350)	31.8	12.7	44.5	76.2	88.9	41.3	82.6	32	M18	35	80	123	44.1	18.7	120	152	180

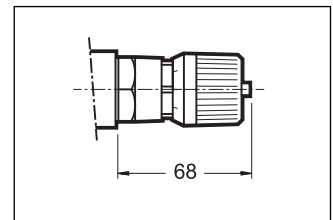
6 - RQA5-P AND RQA7P OVERALL AND MOUNTING DIMENSIONS



7 - ADJUSTMENT KNOB

The valves can be equipped with a SICBLOC adjustment knob. To operate it, push and rotate at the same time.

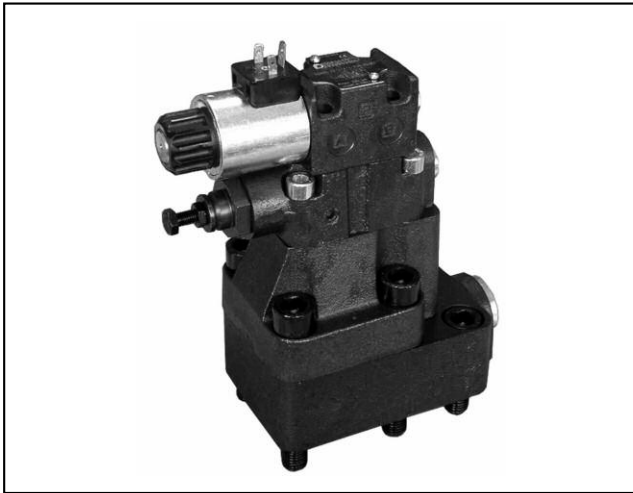
To request this option, add **M** (see paragraph 1) in the proper square.



8 - SUBPLATES

(see catalogue 51 000)

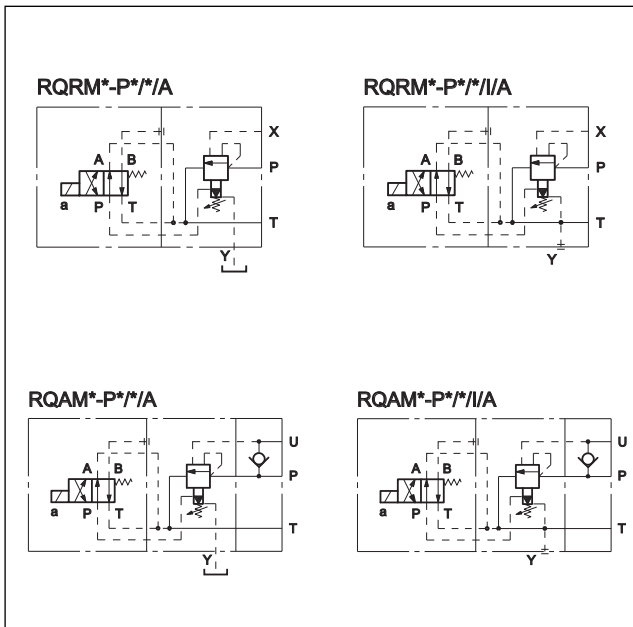
	RQR3-P	RQR5-P	RQR7-P	RQA5-P	RQA7-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports	PMRQA5-AI5G rear ports	PMRQA7-AI7G rear ports
P, T, U ports dimensions	P: 1/2" BSP T: 3/4" BSP	1" BSP	1" 1/4 BSP	3/4" BSP	1" 1/4 BSP
X port dimension	1/4" BSP	1/4" BSP	1/4" BSP	-	-



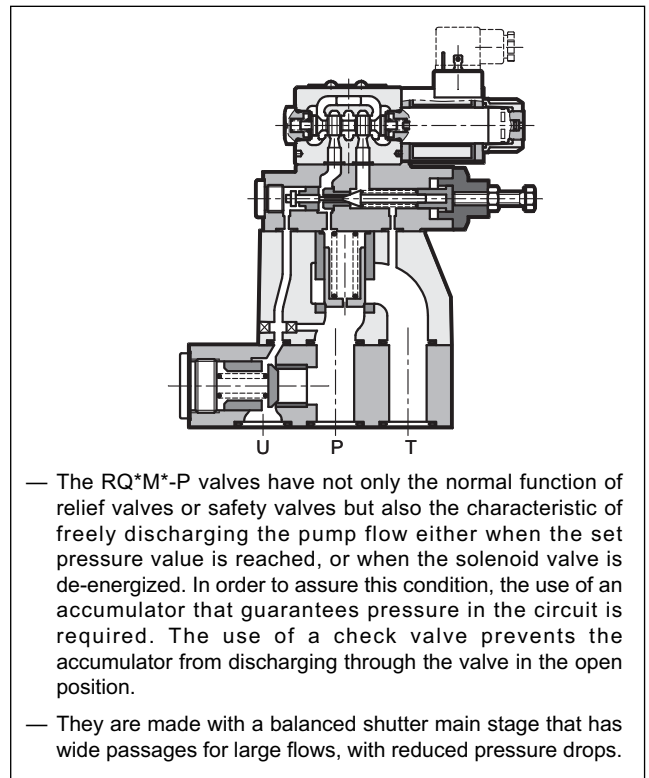
RQ*M*-P
UNLOADING VALVE
WITH AUTOMATIC OR
SOLENOID OPERATED VENTING
(FOR CIRCUITS WITH ACCUMULATOR)
SERIES 51
RQRM*-P
FOR REMOTE PILOTING
RQAM*-P
WITH INCORPORATED CHECK VALVE

SUBPLATE MOUNTING

HYDRAULIC SYMBOLS



OPERATING PRINCIPLE



PERFORMANCES

(measured with mineral oil of viscosity 36 cSt at 50°C)

		RQRM3-P	RQRM5-P	RQRM7-P	RQAM5-P	RQAM7-P
Maximum operating pressure	bar	350				
Maximum flow rate	l/min	200	400	500	400	500
Ambient temperature range	°C	-20 / +50				
Fluid temperature range	°C	-20 / +80				
Fluid viscosity range	cSt	10 ÷ 400				
Fluid contamination degree		According to ISO 4406:1999 class 20/18/15				
Recommended viscosity	cSt	25				
Mass	Kg	5	5,8	8	12	19

NOTE: for the solenoid valve DS3 characteristics see catalogue 41 150

1 - IDENTIFICATION CODE

R	Q	M	-	P	/	/	A	/	/	/	51	-	K1	/	
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	-----------	----------	-----------	----------	--

Unloading valve

Automatic venting for circuits with accumulator
R = for remote piloting
A = with embedded check valve (unavailable on size 3)

Solenoid valve for electrical unloading

Size: _____
3 = (RQRM3-P) ISO 6264-06-09-* -97 (CETOP R06)
5 = (RQRM5-P) ISO 6264-08-13-* -97 (CETOP R08)
5 = (RQAM5-P)
7 = (RQRM7-P) ISO 6264-10-17-* -97 (CETOP R10)
7 = (RQAM7-P)

Subplate mounting _____

Pressure adjustment range: _____
3 = up to 70 bar **6** = up to 280 bar
5 = up to 210 bar

Differential pressure (values $\pm 2.5\%$) _____
1 = pump switch on at 75% of the set value
2 = pump switch on at 63% of the set value

Unloading with de-energized solenoid _____

I = internal drainage (not possible when the backpressure on the return line is greater than 2 bar). Omit for external drainage.

CM = manual override, boot protected.
Omit for override integrated in the tube (standard)

Coil electrical connection: plug for connector type DIN 43650 (standard)

DC power supply
D12 = 12 V
D24 = 24 V
D48 = 48 V
D110 = 110 V
D220 = 220 V
D00 = valve without coils (see NOTE)

AC power supply
A24 = 24 V - 50 Hz
A48 = 48 V - 50 Hz
A110 = 110 V - 50 Hz / 120 V - 60 Hz
A230 = 230 V - 50 Hz / 240 V - 60 Hz
A00 = valve without coils (see NOTE)
F110 = 110 V - 60 Hz
F220 = 220 V - 60 Hz

Seals:
N = NBR seals for mineral oil (standard)
V = FPM seals for special fluids

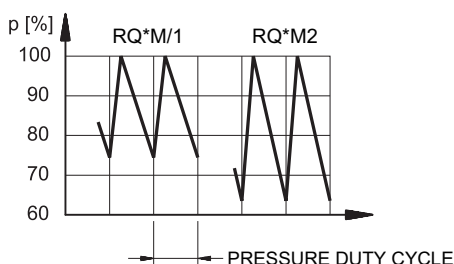
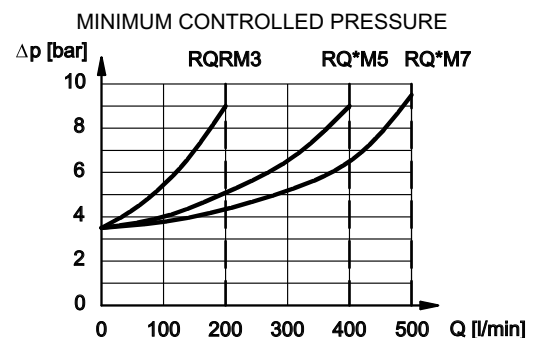
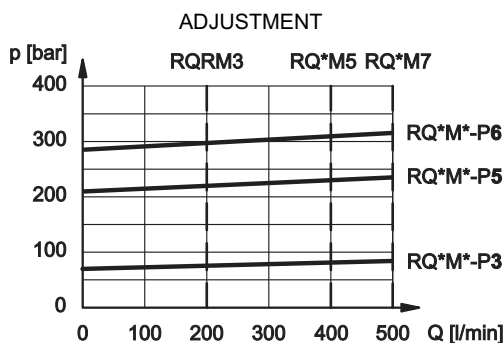
Series No. (the overall and mounting dimensions remain unchanged from 50 to 59)

M = adjustment with SICBLOC knob (omit for adjustment with hexagonal head screw)

NOTE: The locking rings of the coils and the relevant O-Rings are supplied together with valves

2 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)



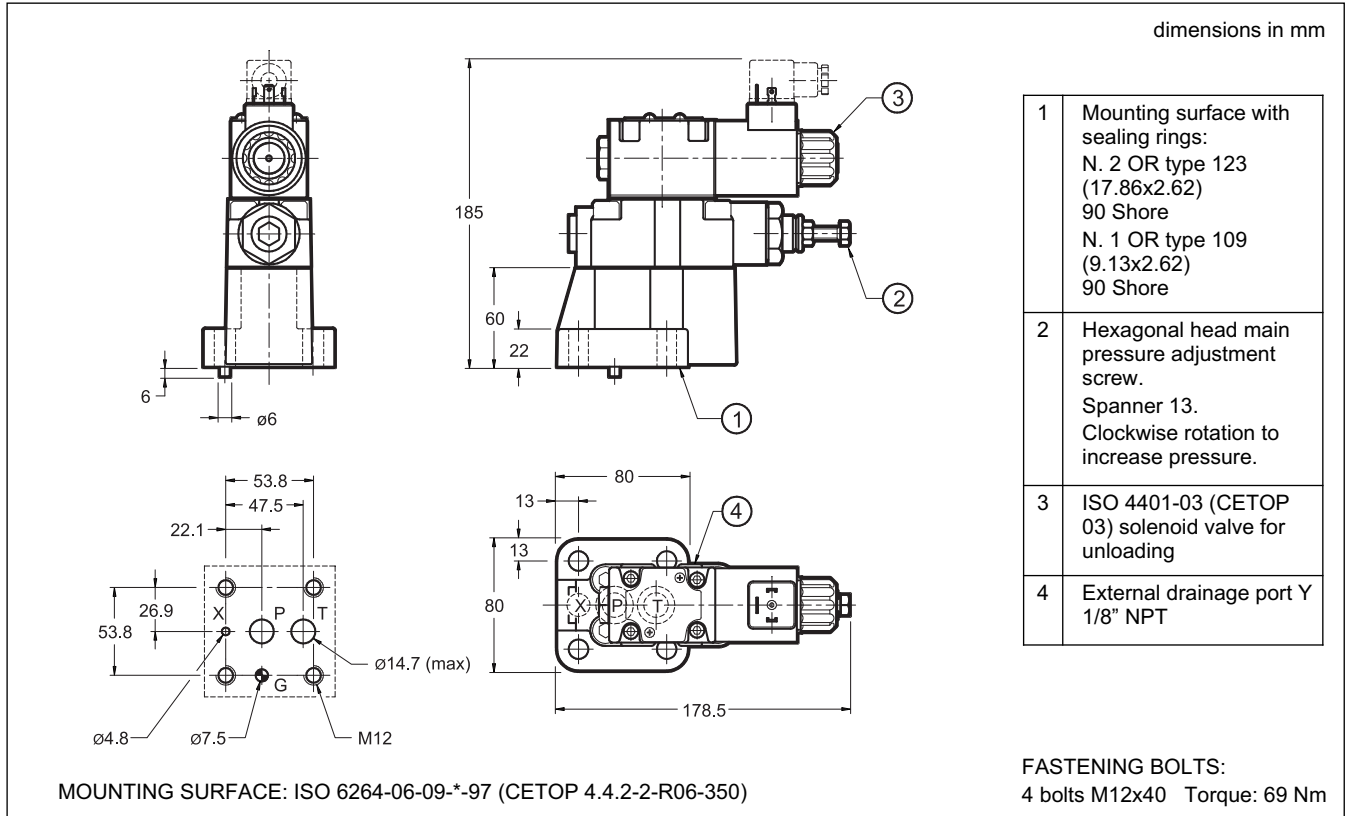
3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

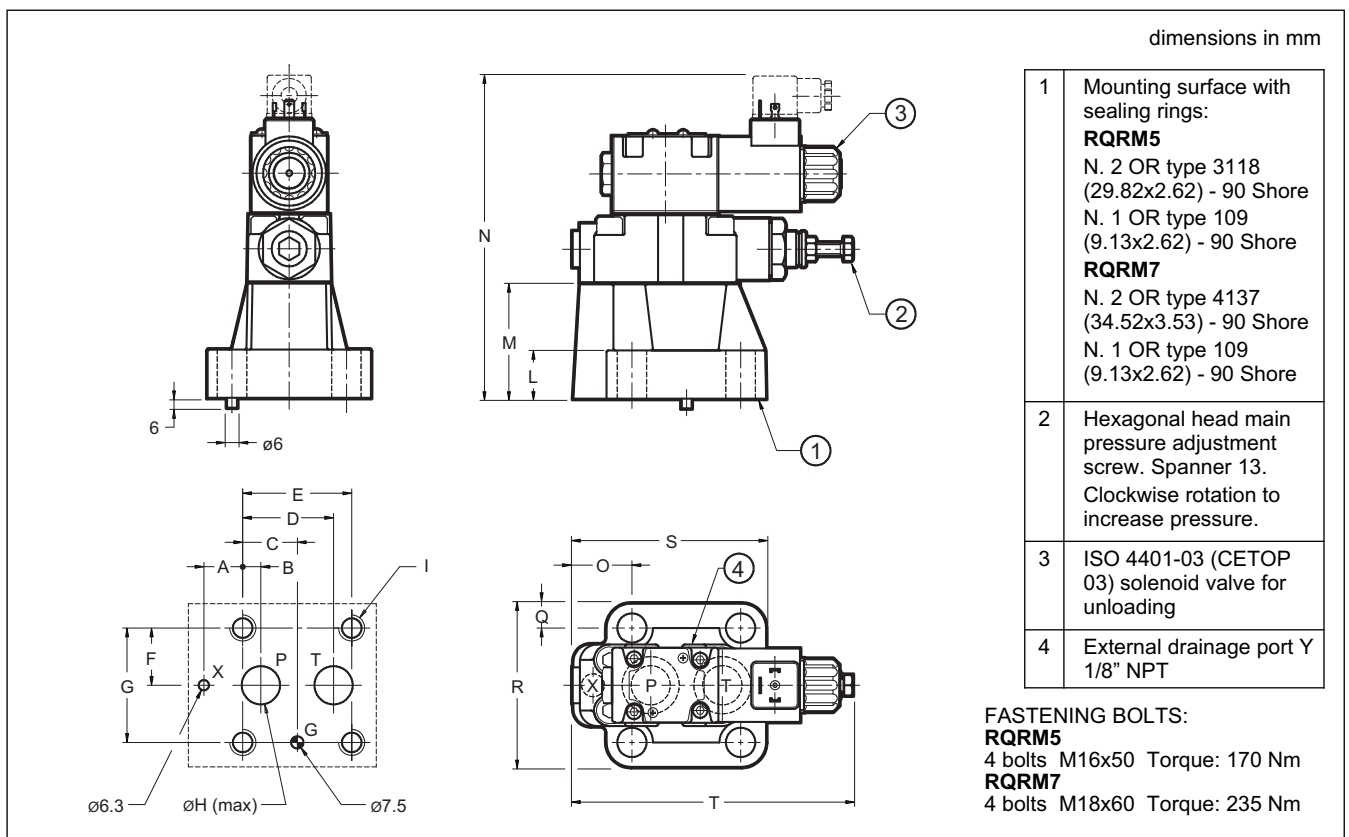
Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - RQRM3-P OVERALL AND MOUNTING DIMENSIONS

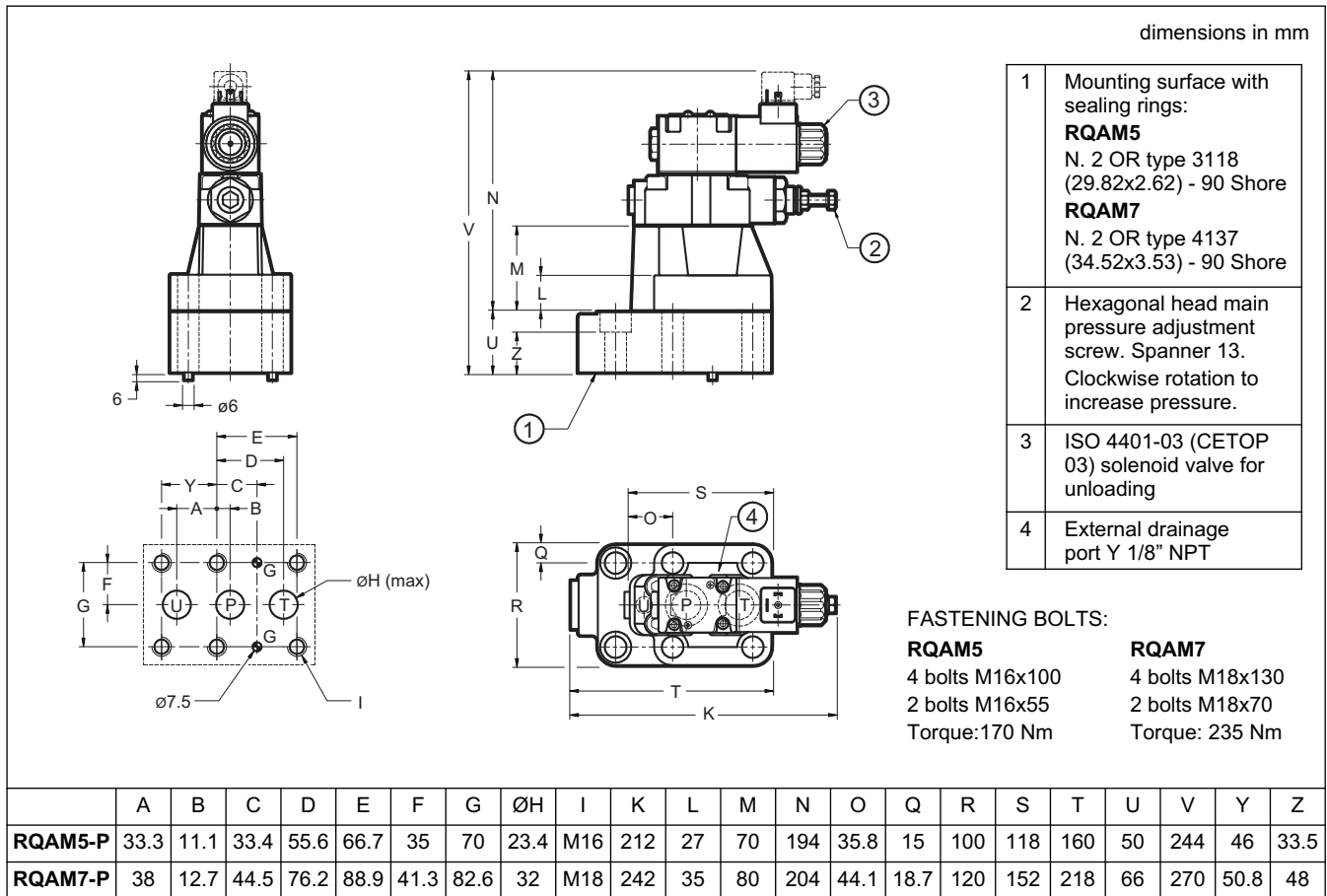


5 - RQRM5-P AND RQRM7-P OVERALL AND MOUNTING DIMENSIONS



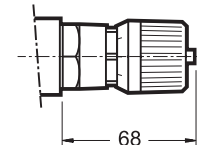
MOUNTING SURFACE		A	B	C	D	E	F	G	ØH	I	L	M	N	O	Q	R	S	T
RQRM5-P	ISO 6264-08-13-*-97 (CETOP 4.4.2-2-R08-350)	23.8	11.1	33.4	55.6	66.7	35	70	23.4	M16	27	70	194	35.8	15	100	118	170
RQRM7-P	ISO 6264-10-17-*-97 (CETOP 4.4.2-2-R10-350)	31.8	12.7	44.5	76.2	88.9	41.3	82.6	32	M18	35	80	204	44.1	18.7	120	152	180

6 - RQAM5-P AND RQAM7-P OVERALL AND MOUNTING DIMENSIONS



7 - ADJUSTMENT KNOB

The RQ*M*-P valves can be equipped with a SICBLOC adjustment knob. To operate it, push and rotate at the same time. To request this option, add: /M (see paragraph 1).



8 - ELECTRIC CONNECTORS

The solenoid valves are never supplied with connectors. Connectors must be ordered separately, please see catalogue 49 000.

9 - MANUAL OVERRIDE, BOOT PROTECTED: CM

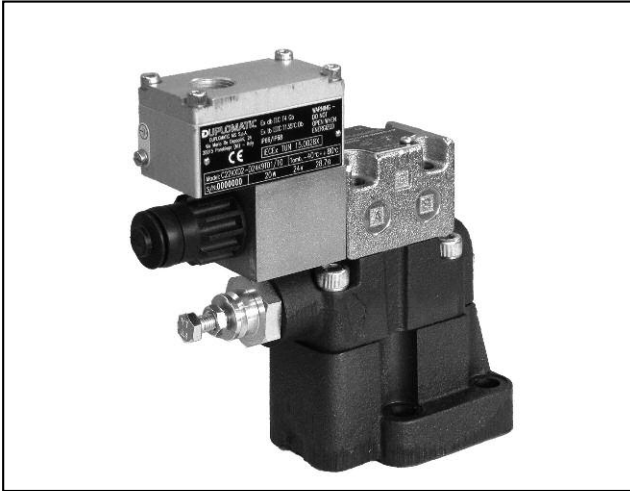
Whenever the solenoid valve installation may involve exposure to atmospheric agents or utilization in tropical climates, use of the manual override, boot protected is recommended. Add the suffix **CM** to request this device (see paragraph 1).

For overall dimensions see catalogue 41 150.

10 - SUBPLATES

(see catalogue 51 000)

	RQRM3-P	RQRM5-P	RQRM7-P	RQAM5-P	RQAM7-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports	PMRQA5-AI5G rear ports	PMRQA7-AI7G rear ports
P, T, U ports dimensions	P: 1/2" BSP T: 3/4" BSP	1" BSP	1" 1/4 BSP	3/4" BSP	1" 1/4 BSP
X port dimensions	1/4" BSP	1/4" BSP	1/4" BSP	-	-



RQM*K*-P

EXPLOSION-PROOF SOLENOID OPERATED PRESSURE RELIEF VALVES WITH UNLOADING AND PRESSURE SELECTION ATEX, IECEx, INMETRO SERIES 10

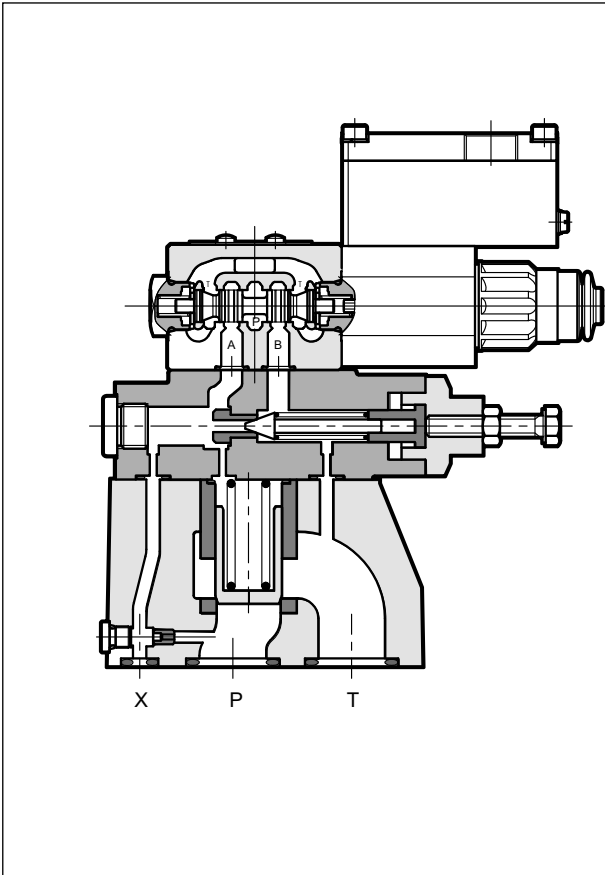
SUBPLATE MOUNTING

RQM3K*-P ISO 6264-06

RQM5K*-P ISO 6264-08

RQM7K*-P ISO 6264-10

OPERATING PRINCIPLE



- The RQM*K*-P are explosion-proof pressure relief valves for subplate mounting ISO 6264. They are available in three nominal sizes for flows up to 500 l/min.
- They are compliant with ATEX, IECEx and INMETRO requirements and are suitable for use in potentially explosive atmospheres, for surface plants or mines.
- A low temperature version (up to -40 °C) is also available.
- They are available in five versions that allow the unloading of the total flow or the selection of up to three pressure values (see paragraph 2 - Versions) by means of a solenoid valve.
- They are supplied with a hexagonal head adjustment screw. Upon request, it can be equipped with a SICBLOC adjustment knob on the main pressure control.
- The adjustment of the second and third pressure values is obtained by a pressure relief valve placed between the main stage and the solenoid valve.
- The valves are supplied with standard surface treatment of phosphating black for the main body and zinc-nickel for the pilot body. Upon request we can supply these valves completely with zinc-nickel surface treatment, suitable to ensure a salt spray resistance up to 600 h.
- **Details for classification, operating temperatures and electrical characteristics are in the technical data sheet 02 500 'Explosion proof classification'.**

PERFORMANCES

(obtained with mineral oil with viscosity of 36 cSt at 50°C)

		RQM3K*-P	RQM5K*-P	RQM7K*-P
Maximum operating pressure	bar		350	
Maximum flow rate	l/min	200	400	500
Temperature range (ambient and fluid)		see data sheet 02 500		
Fluid viscosity range	cSt	10 ÷ 400		
Fluid contamination degree		According to ISO 4406:1999 class 20/18/15		
Recommended viscosity	cSt	25		



1 - IDENTIFICATION CODE

R	Q	M		- P	/	/	/ 10	-	K9	/			
----------	----------	----------	--	------------	----------	----------	-------------	----------	-----------	----------	--	--	--

Pilot operated pressure relief valve

Solenoid valve for unloading / pressure selection

Size: _____
3 = ISO 6264-06
5 = ISO 6264-08
7 = ISO 6264-10

Explosion-proof certification:
See table 1.1

Subplate mounting _____

Pressure adjustment range: _____
3 = up to 70 bar
5 = up to 210 bar
6 = up to 350 bar

Versions: **A** } see description
B } in the table 2 - versions
C }
D }
G }

M = adjustment with SICBLOC knob _____
 available only on the main pressure control
 Omit for adjustment with hexagonal head screw

Series No. _____
 (the overall and mounting dimensions remain unchanged from 10 to 19)

Seals: _____
 For temperature range -20 / +80 °C
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids
 For temperature range -40 / +80 °C
NL = seal for low temperatures (for mineral oil)

Option: surface treatment not standard. Omit if not required (see NOTE)

Option: /T5 version in T5 temperature class. Omit if not required.

Manual override:
CM = boot protected **standard for both N and V seals** not available for NL seals
CB = blind ring nut **standard for NL seals** available upon request for both N and V seals see at par. 12

Connection type for cable gland upper connection:
T01 = M20x1.5 - ISO 261
T02 = Gk 1/2 - UNI EN 10226-2 not available for INMETRO
T03 = 1/2" NPT - ANSI B1.20.1 (ex ANSI B2.1)
side connection:
S01 = M20x1.5 - ISO 261
S02 = Gk 1/2 - UNI EN 10226-2 not available for INMETRO
S03 = 1/2" NPT - ANSI B1.20.1 (ex ANSI B2.1)
S04 = M16x1.5 - ISO 261

Coil electrical connection:
 junction box

Power supply:
 Direct current (DC)
D12 = 12 V
D24 = 24 V
D48 = 48 V
D110 = 110 V
 Alternate current with built-in rectifier bridge (RAC)
R120 = 120 V
R240 = 240 V

Version with monobloc steel coil
 Standard coils are made from zinc-nickel steel and with anodized aluminium junction box.
 On request, monobloc coils **MD24K9S01** are available completely made from steel, with zinc-nickel treatment (power supply voltage D24 and cable gland connection type S01). Other variants for voltage and cable gland connection are available, always on request.

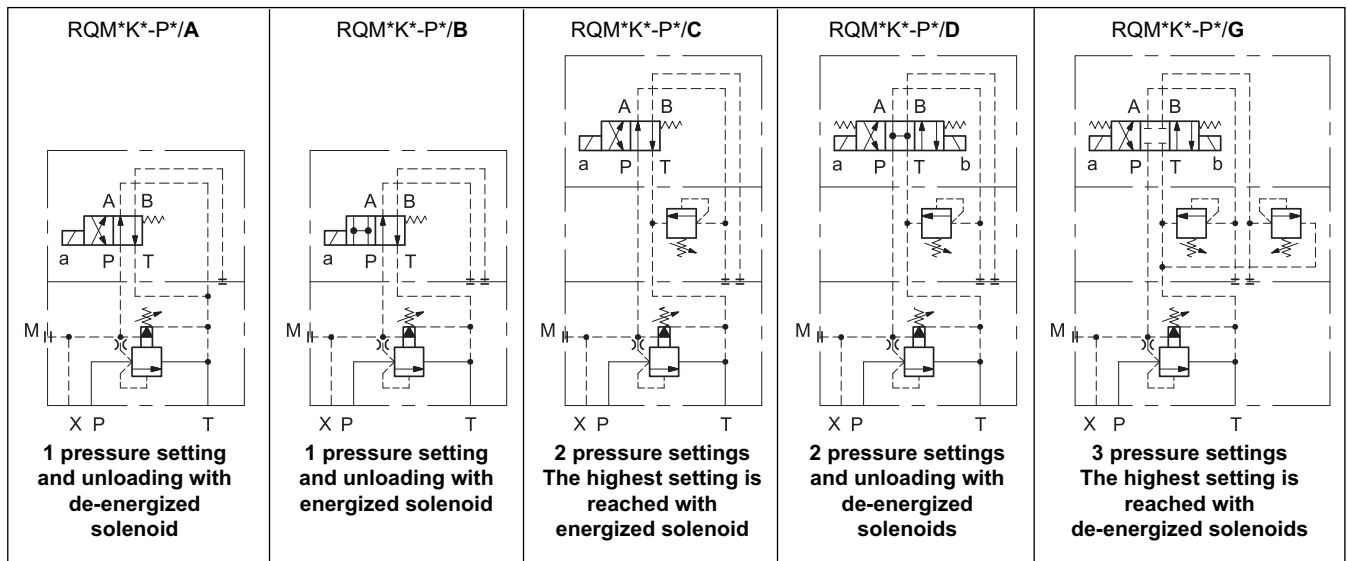
NOTE: Valves are supplied with standard surface treatment of phosphating black for the main body and zinc-nickel for the pilot body.
 Upon request we can supply these valves with full zinc-nickel surface treatment, suitable to ensure a salt spray resistance up to 600 h (test operated according to UNI EN ISO 9227 standards and test evaluation operated according to UNI EN ISO 10289 standards).
 For full zinc-nickel surface treatment add the suffix **/W7** at the end of the identification code.

1.1 - Names of valves per certification

	ATEX		IECEX		INMETRO	
for gases for dusts	KD2	II 2GD	KXD2	IECEX Gb IECEX Db	KBD2	INMETRO Gb INMETRO Db
for mines	KDM2	I M2	KXDM2	IECEX Mb	KBDM2	INMETRO Mb

NOTE: Refer to the technical data sheet 02 500 for marking, operating temperatures and available versions.

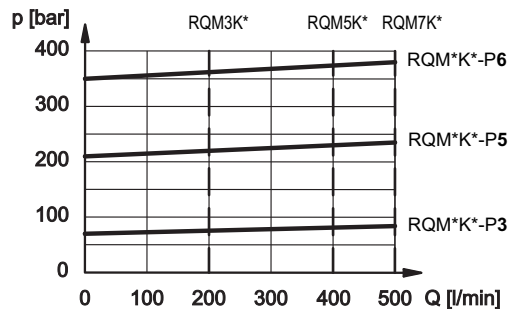
2 - VERSIONS



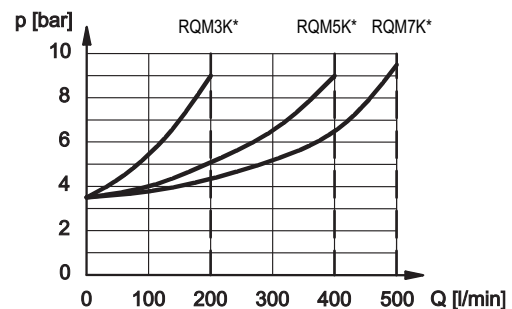
3 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)

ADJUSTMENT



MINIMUM CONTROLLED PRESSURE





4 - ELECTRICAL CHARACTERISTICS

(values ± 5%)

Coil type	Nominal voltage [V]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt. [W]
D12	12	7,2	1,7	20
D24	24	28,7	0,83	20
D48	48	115	0,42	20
D110	110	549	0,2	22

Coil type (NOTE)	Nominal voltage [V]	Freq. [Hz]	Resistance at 20°C [Ω]	Current consumpt. [A]	Power consumpt. [VA]
R120	110V-50Hz 120V-60Hz	50/60	489,6	0,19	21
				0,21	25
R240	230V-50Hz 240V-60Hz	50/60	2067,7	0,098	22,5
				0,1	24

VOLTAGE SUPPLY FLUCTUATION (ripple included)	± 10% Vnom
MAX SWITCH ON FREQUENCY	6.000 ins/hour
DUTY CYCLE	100%
ELECTROMAGNETIC COMPATIBILITY (EMC)	According to 2014/30/EU
CLASS OF PROTECTION: Atmospheric agents Coil insulation (VDE 0580)	Ip66 / IP68 class H

NOTE: type R* coils are for alternating current supply for both 50 or 60 Hz. For R* coils the resistance can not be measured in the usual way because of the presence of diodes bridge inside the coil.

4.1 - Wiring

In order to realise the electrical connection of the coil, it is necessary to access the terminal block (1) unscrewing the 4 screws (2) that fasten the cover (3) with the box (4) that contains the terminal block.

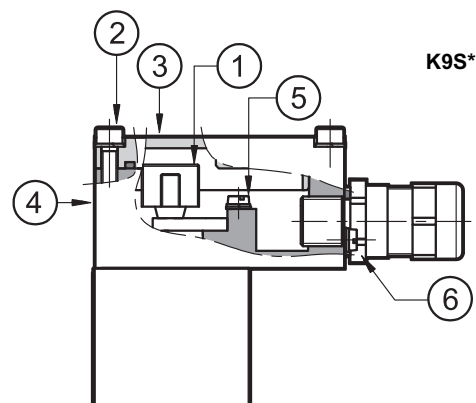
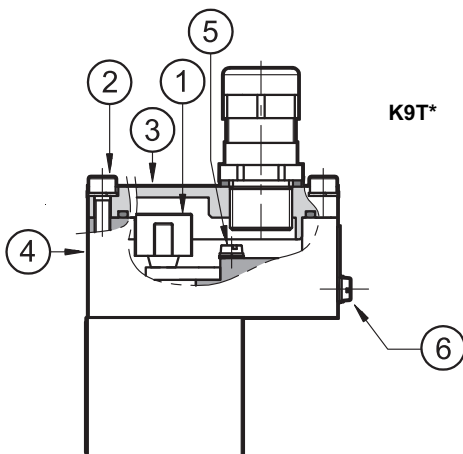
The electrical connection is polarity-independent.

By doing electrical connection it is important to connect also the grounding point (5) in the terminal block box (M4 screws), through suitable conductors with the general grounding line of the system.

On the external body of the coil there is a grounding point (6) (M4 screw) that allow to ensure equipotentiality between the valve and the general grounding line of the system; connecting this point the regulation of the EN 13463-1 standard, that impose to verify the equipotentiality of the elements included in a potentially explosive environment (the maximum resistance between the elements must be 100 Ω), is guaranteed.

At the end of the electrical wiring, it is necessary to reassemble the cover (3) on the box (4), checking the correct positioning of the seal located in the cover seat and fastening the 4 M5 screws with a torque of 4.9÷6 Nm.

Electrical wiring must be done following in compliance with standards about protection against explosion hazards.



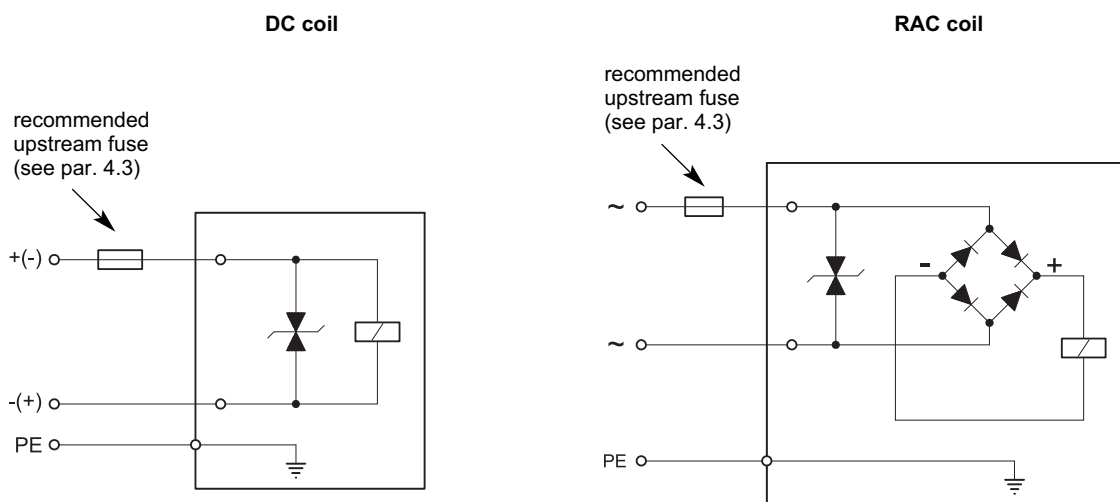
Characteristics of the cables connectable for wiring are indicated in the table below:

Function	Cable section
Operating voltage cables connection	max 2.5 mm ²
Connection for internal grounding point	max 2.5 mm ²
Connection for external equipotential grounding point	max 6 mm ²

Cables for wiring must be non-armoured cables, with external covering sheath and must be suitable for use in environments with temperatures from - 20 °C to +110 °C (for valves either with N or V seals) or from - 40 °C to +110 °C (for valves with NL seals).

Cable glands (which must be ordered separately, see paragraph 14) allow to use cables with external diameter between 8 and 10 mm.

4.2 - Electrical diagrams



4.3 - Overcurrent fuse and switch-off voltage peak

Upstream of each valve, an appropriate fuse (max 3 x I_n according to IEC 60127) or a protective motor switch with short-circuit and thermal instantaneous tripping, as short-circuit protection, must be connected. The cut-off power of the fuse must correspond or exceed the short circuit current of the supply source. The fuse or the protective motor must be placed outside the dangerous area or they must be protected with an explosion-proof covering.

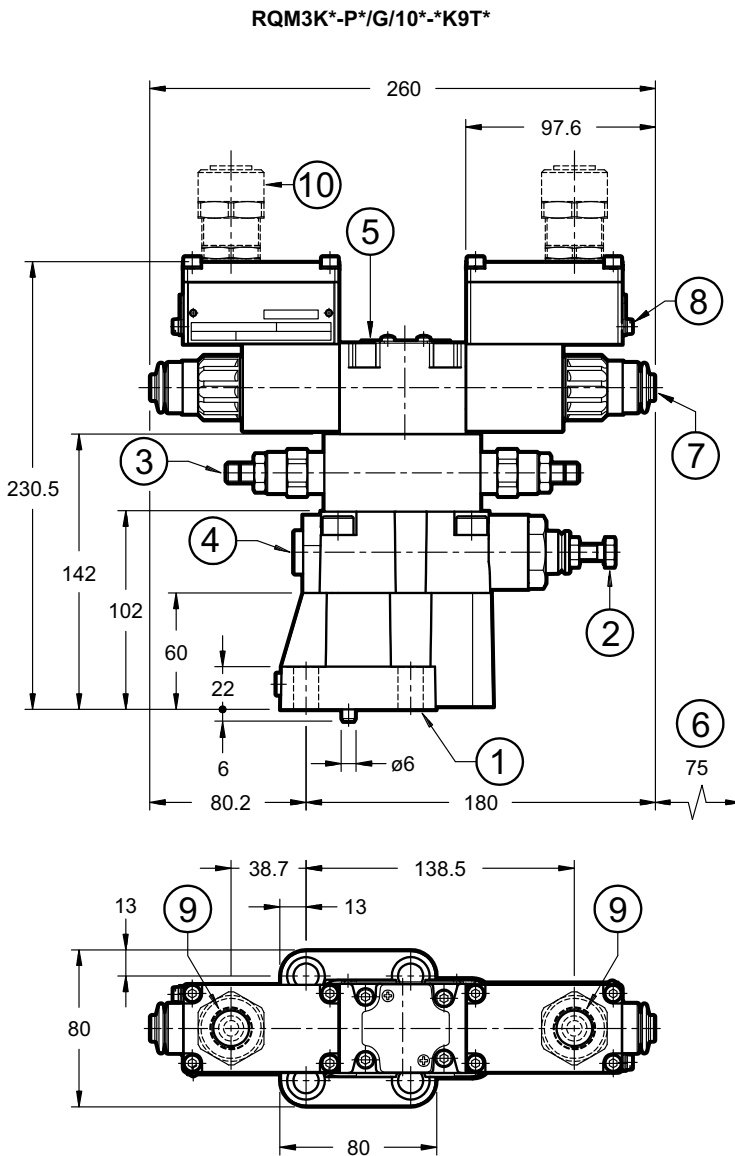
In order to safeguard the electronic device to which the valve is connected, there is a protection circuit in the coil, that reduces voltage peaks, which can occur when inductances are switched off.

The table shows the type of fuse recommended according to the nominal voltage of the valve and to the value of the voltage peaks reduction.

Coil type	Nominal voltage [V]	Rated current [A]	Recommended pre-fuse characteristics medium time-lag according to DIN 41571 [A]	Maximum voltage value upon switch off [V]	Suppressor circuit
D12	12	1,7	2,5	- 49	Transient voltage suppressor bidirectional
D24	24	0,83	1,25	- 49	
D48	48	0,42	0,6	- 81	
D110	110	0,2	0,3	- 309	
R120	120	0,21	0,3	- 3	
R240	240	0,1	0,15	- 3	

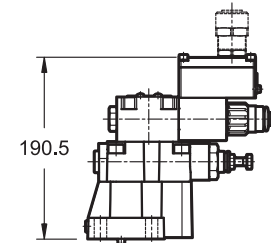
5 - RQM3K*-P WITH UPPER CONNECTION - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

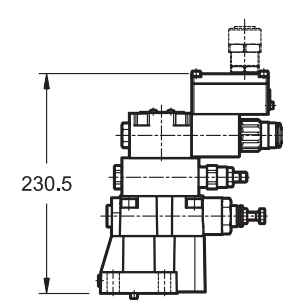


RQM3K*-P*/A/10*-K9T*

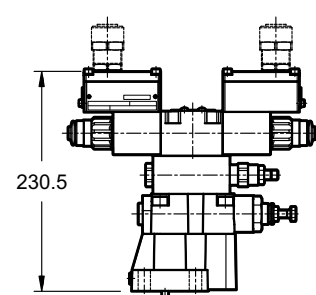
RQM3K*-P*/B/10*-K9T*



RQM3K*-P*/C/10*-K9T*



RQM3K*-P*/D/10*-K9T*



NOTE: for side connection cable gland see paragraph 8.

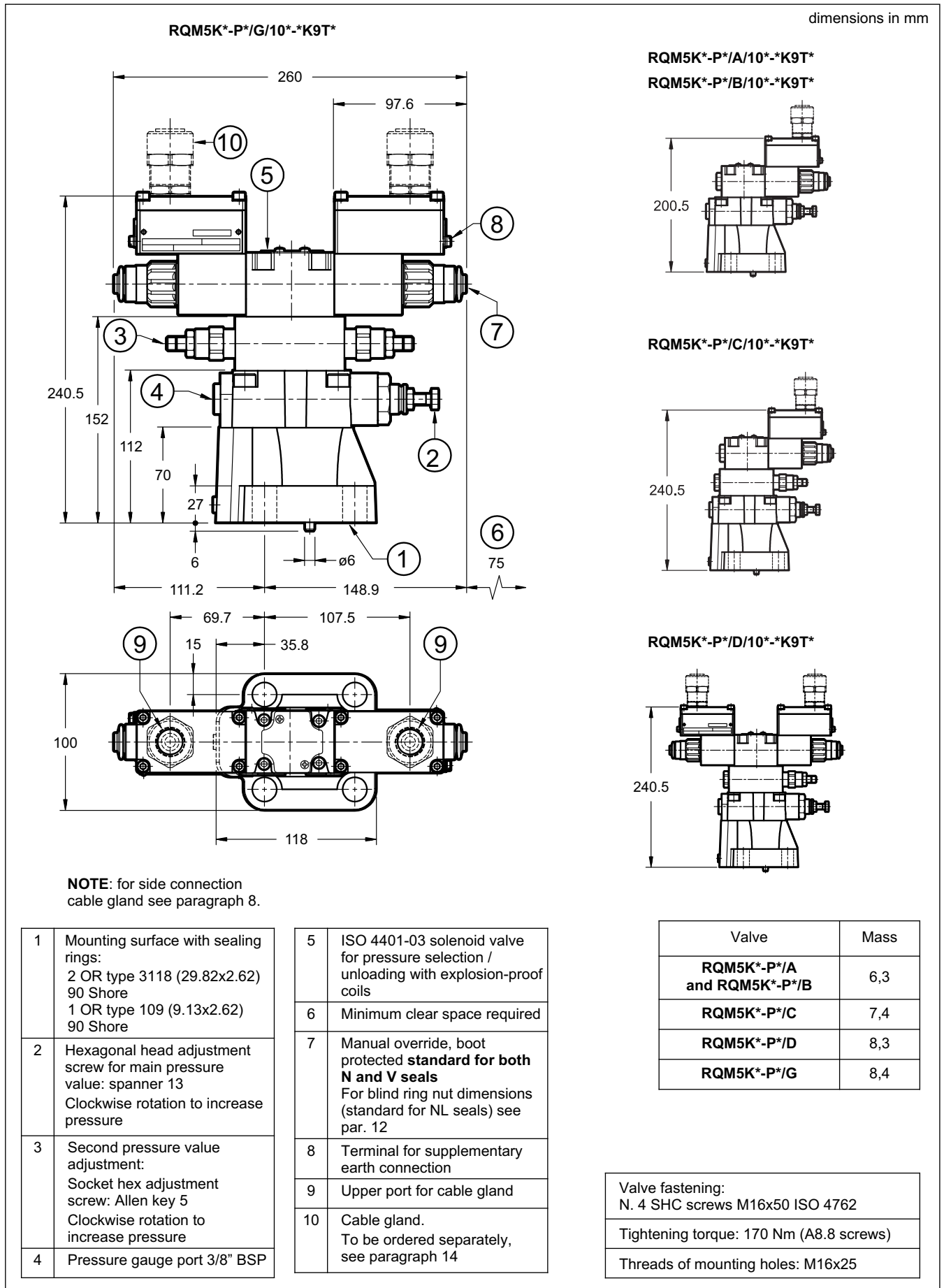
1	Mounting surface with sealing rings: 2 OR type 123 (17.86x2.62) 90 Shore 1 OR type 109 (9.13x2.62) 90 Shore
2	Hexagonal head adjustment screw for main pressure value: spanner 13 Clockwise rotation to increase pressure
3	Second pressure value adjustment: Socket hex adjustment screw: Allen key 5 Clockwise rotation to increase pressure
4	Pressure gauge port 3/8" BSP

5	ISO 4401-03 solenoid valve for pressure selection / unloading with explosion-proof coils
6	Minimum clear space required
7	Manual override, boot protected standard for both N and V seals For blind ring nut dimensions (standard for NL seals) see par. 12
8	Terminal for supplementary earth connection
9	Upper port for cable gland
10	Cable gland . To be ordered separately, see paragraph 14

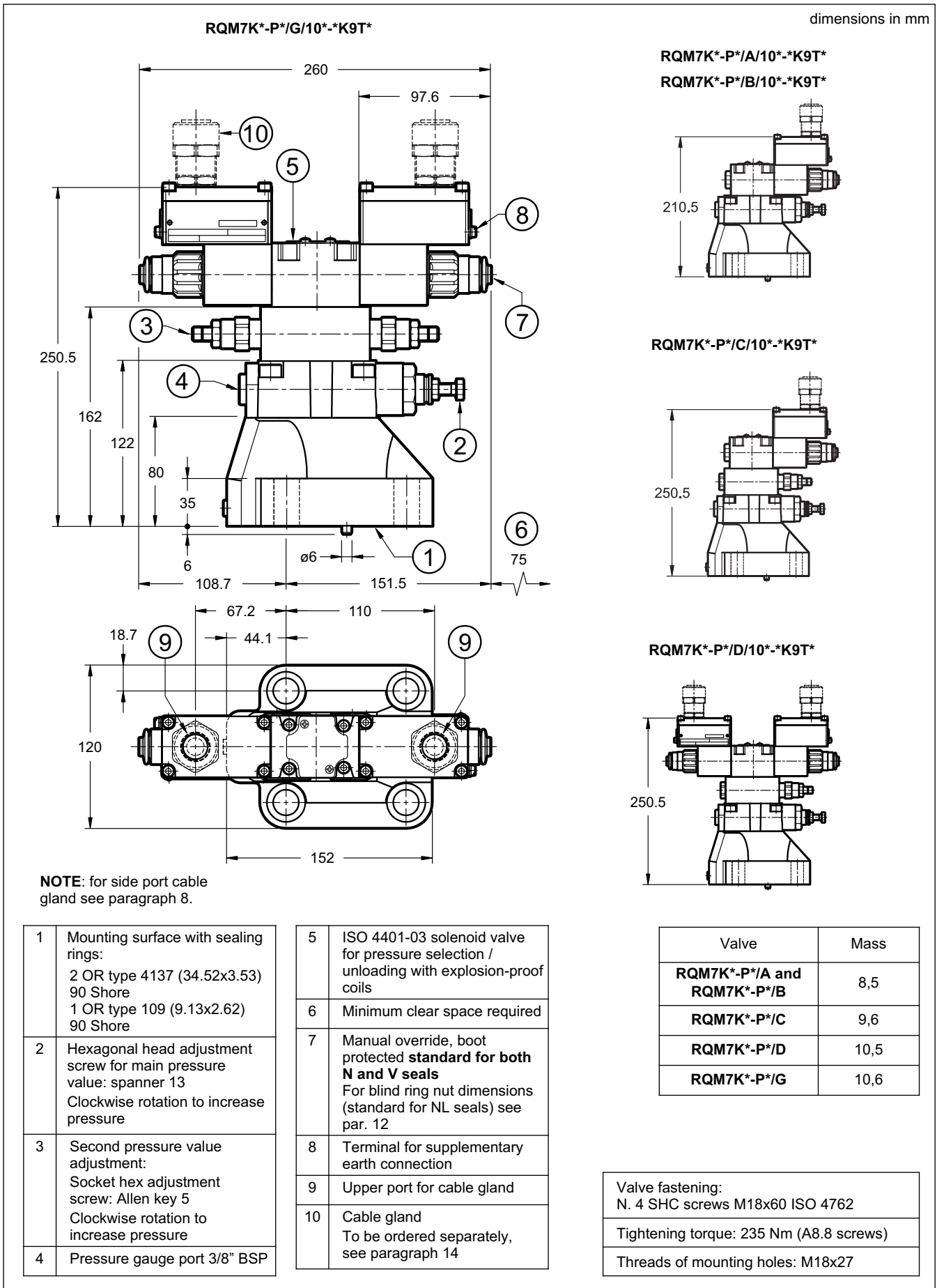
Valve	Mass
RQM3K*-P*/A and RQM3K*-P*/B	5,3
RQM3K*-P*/C	6,4
RQM3K*-P*/D	7,3
RQM3K*-P*/G	7,4

Valve fastening: N. 4 SHC screws M12x40 ISO 4762
Tightening torque: 69 Nm (A8.8 screws)
Threads of mounting holes: M12x20

6 - RQM5K*-P WITH UPPER CONNECTION - OVERALL AND MOUNTING DIMENSIONS

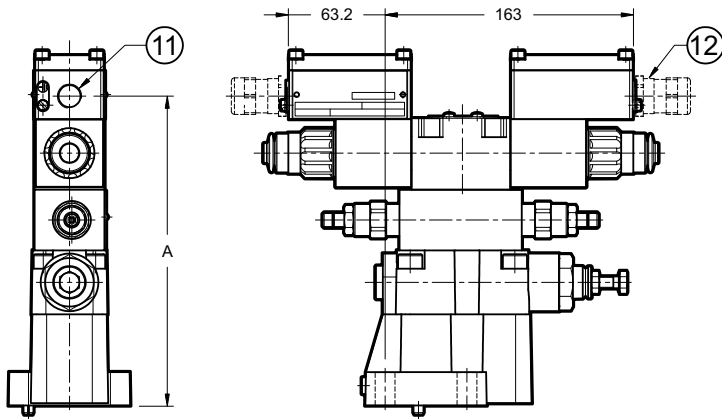


7 - RQM7K*-P WITH UPPER CONNECTION - OVERALL AND MOUNTING DIMENSIONS



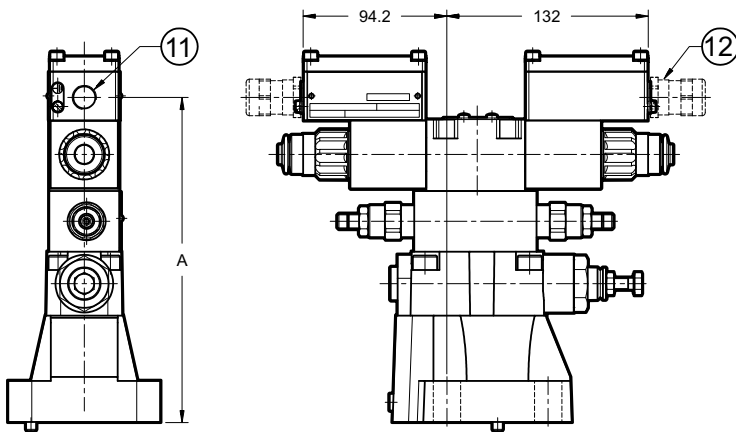
8 - RQM*K*-P* SIDE CONNECTION OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



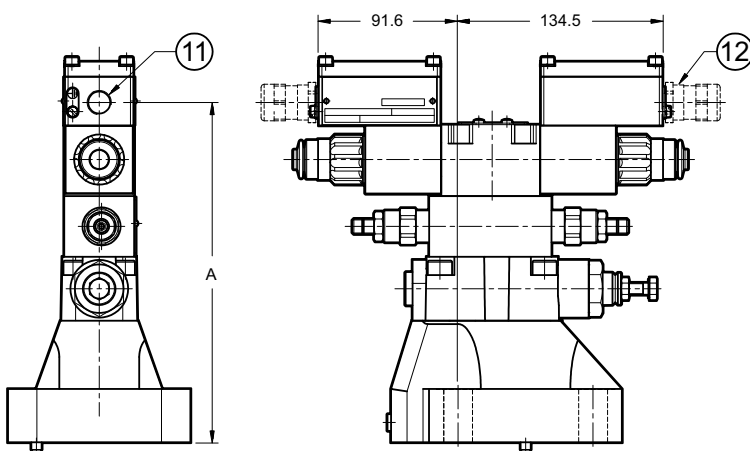
RQM3K*-P*/10*-K9S*

Side port type	Dimension A	
	RQM3K*-P*/A RQM3K*-P*/B	RQM3K*-P*/C RQM3K*-P*/D RQM3K*-P*/G
S01, S04	162.5	202.5
S02, S03	162	202



RQM5K*-P*/10*-K9S*

Side port type	Dimension A	
	RQM5K*-P*/A RQM5K*-P*/B	RQM5K*-P*/C RQM5K*-P*/D RQM5K*-P*/G
S01, S04	172.5	212.5
S02, S03	172	212



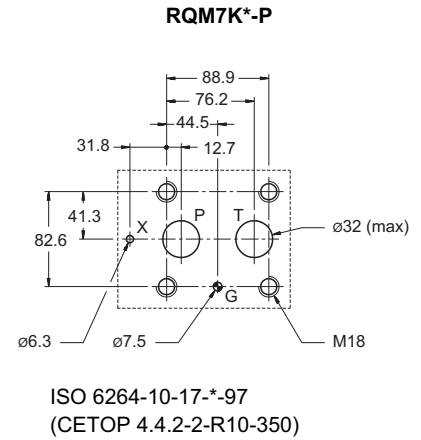
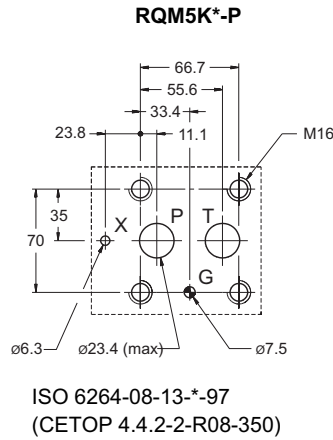
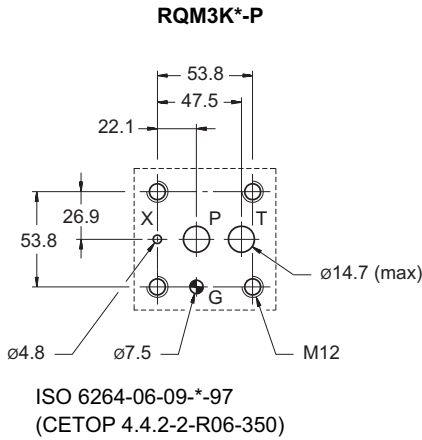
RQM7K*-P*/10*-K9S*

Side port type	Dimension A	
	RQM7K*-P*/A RQM7K*-P*/B	RQM7K*-P*/C RQM7K*-P*/D RQM7K*-P*/G
S01, S04	182.5	222.5
S02, S03	182	222

11	Side port
12	Cable gland To be ordered separately, see par. 14



9 - MOUNTING SURFACES



10 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

11 - INSTALLATION

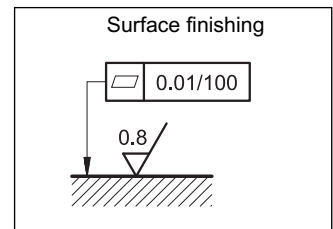


Installation must adhere to instructions reported in the *Use and Maintenance manual*, always supplied with the valve. Unauthorized interventions can be harmful to people and goods because of the explosion hazards present in potentially explosive atmospheres.

The valves can be installed in any position without impairing correct operation.

Valve fastening takes place by means of screws or tie rods, laying the valve on a lapped surface, with values of planarity and smoothness that are equal to or better than those indicated in the drawing.

If the minimum values of planarity or smoothness are not met, fluid leakages between valve and mounting surface can easily occur.



12 - MANUAL OVERRIDE CB

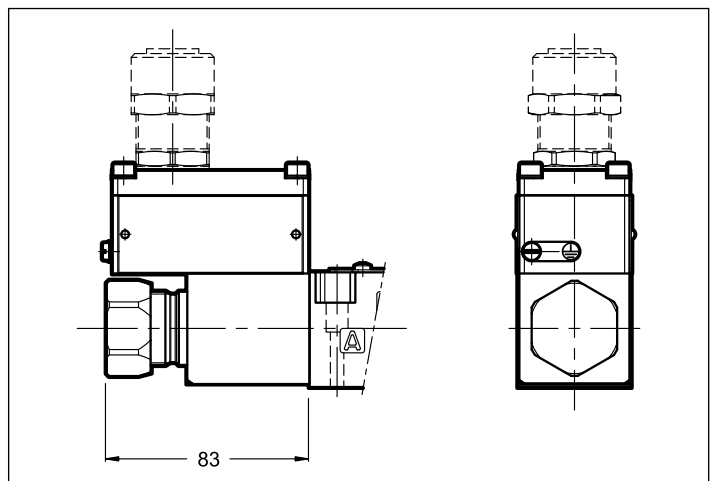
CB - Blind ring nut

The metal ring nut protects the solenoid tube from atmospheric agents and isolates the manual override from accidental operations. The ring nut is tightened on a threaded fastener that keeps the coil in its position even without the ring nut.

To access the manual override loosen the ring nut and remove it; then reassemble hand tightening, until it stops.

Activate the manual override always and only with non-sparking tools suitable for use in potentially explosive atmospheres.

More information on safe use of explosion-proof components are provided in the instruction manual, always supplied with the valve.

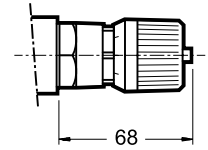




13 - ADJUSTMENT KNOB

The valves can be equipped with a SICBLOC adjustment knob, only on the main pressure regulation. To operate it, push and rotate at the same time.

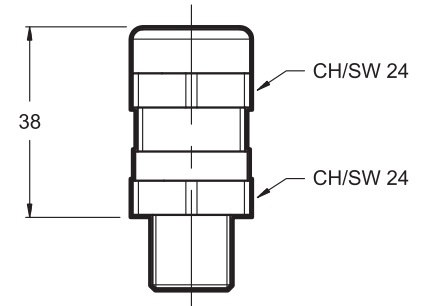
To request this option, add: /M (see paragraph 1).



14 - CABLE GLANDS

Cable glands must be ordered separately; Duplomatic offers some types of cable glands with the following features:

- version for non-armoured cable, external seal on the cable (suitable for Ø8÷10 mm cables);
- ATEX II 2GD, I M2; IECEX Gb, Db, Mb; INMETRO Gb, Db, Mb certified
- cable gland material: nickel brass
- rubber tip material: silicone
- ambient temperature range: -70 °C ÷ +220 °C
- protection degree: IP66/IP68



To order the desired cable glands, specify description, code and quantity.

Description: CGK2/NB-01/10

Code: 3908108001

M20x1.5 - ISO 261 male thread, suitable for coils with T01 and S01 connections. It is supplied equipped with copper washer, that must be assembled between the cable gland and the coil, so as to ensure IP66/IP68 protection degree.

Tightening torque: 45 ÷ 50 Nm

Description: CGK2/NB-02/10

Code: 3908108002

Gk 1/2 - UNI EN 10226-2 male thread, suitable for coils with T02 and S02 connections. The customer must apply LOCTITE® 243™ threadlocker or similar between the cable gland connection thread and the coil in order to ensure IP66/IP68 protection degree.

Tightening torque: 20 ÷ 25 Nm

Description: CGK2/NB-03/10

Code: 3908108003

1/2" NPT - ANSI B1.20.1 (ex ANSI B2.1), suitable for coils with T03 and S03 connections. The customer must apply LOCTITE® 243™ threadlocker or similar between the cable gland connection thread and the coil in order to ensure IP66/IP68 protection degree.

Tightening torque: 20 ÷ 25 Nm

Description: CGK2/NB-04/10

Code: 3908108004

M16x1.5 - ISO 261 male thread, suitable for coils with S04 connection. It is supplied equipped with copper washer, that must be assembled between the cable gland and the coil, so as to ensure IP66/IP68 protection degree.

Tightening torque: 45 ÷ 50 Nm

15 - SUBPLATES

(see catalogue 51 000)

	RQM3K*-P	RQM5K*-P	RQR7K*-P
Type	PMRQ3-AI4G rear ports	PMRQ5-AI5G rear ports	PMRQ7-AI7G rear ports
P, T ports dimension	P: 1/2" BSP T: 3/4" BSP	1" BSP	1" 1/4 BSP
X port dimension	1/4" BSP	1/4" BSP	1/4" BSP

NOTE: Subplates (to be ordered separately) do not contain neither aluminium nor magnesium at a rate higher than the value allowed by norms according to ATEX directive for category II 2GD and I M2.

The user will bear to do the complete assessment of the ignition risk that can occur from the relative use in potentially explosive environments.



RQM*K-P

SERIES 10



DIPLOMATIC MS S.p.A.

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EXPLOSION-PROOF CLASSIFICATION

for

SOLENOID AND PROPORTIONAL VALVES

ref. catalogues:

pressure control valves

RQM*K*-P	21 515
P*E*K*	81 316
ZDE3K*	81 515
DZCE*K*	81 605

flow control valves

QDE*K*	82 225
---------------	---------------

directional valves

D*K*	41 515
DT3K*	42 215
DS(P)E*K*	83 510

GENERAL INFO

This informative technical datasheet displays information about **classification and marking** of Duplomatic explosion-proof valves range.

Duplomatic MS offers valves with the following certifications:

ATEX	II 2G	II 2D	I M2
IECEX	Gb	Db	Mb
INMETRO	Gb	Db	Mb

Instructions for use and maintenance can be found in the related manuals, always supplied together with valves.



1 - ATEX CLASSIFICATION AND TEMPERATURES

Diplomatic certifies the combination valve-coil for the valves suitable for application and installation in potentially explosive atmospheres, according to ATEX directive; the supply always includes the declaration of conformity to the directive and the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environments.

Coils assembled on these valves have been separately certified according to ATEX directive and so they are suitable for use in potentially explosive atmospheres.

1.1 - ATEX classification for valves

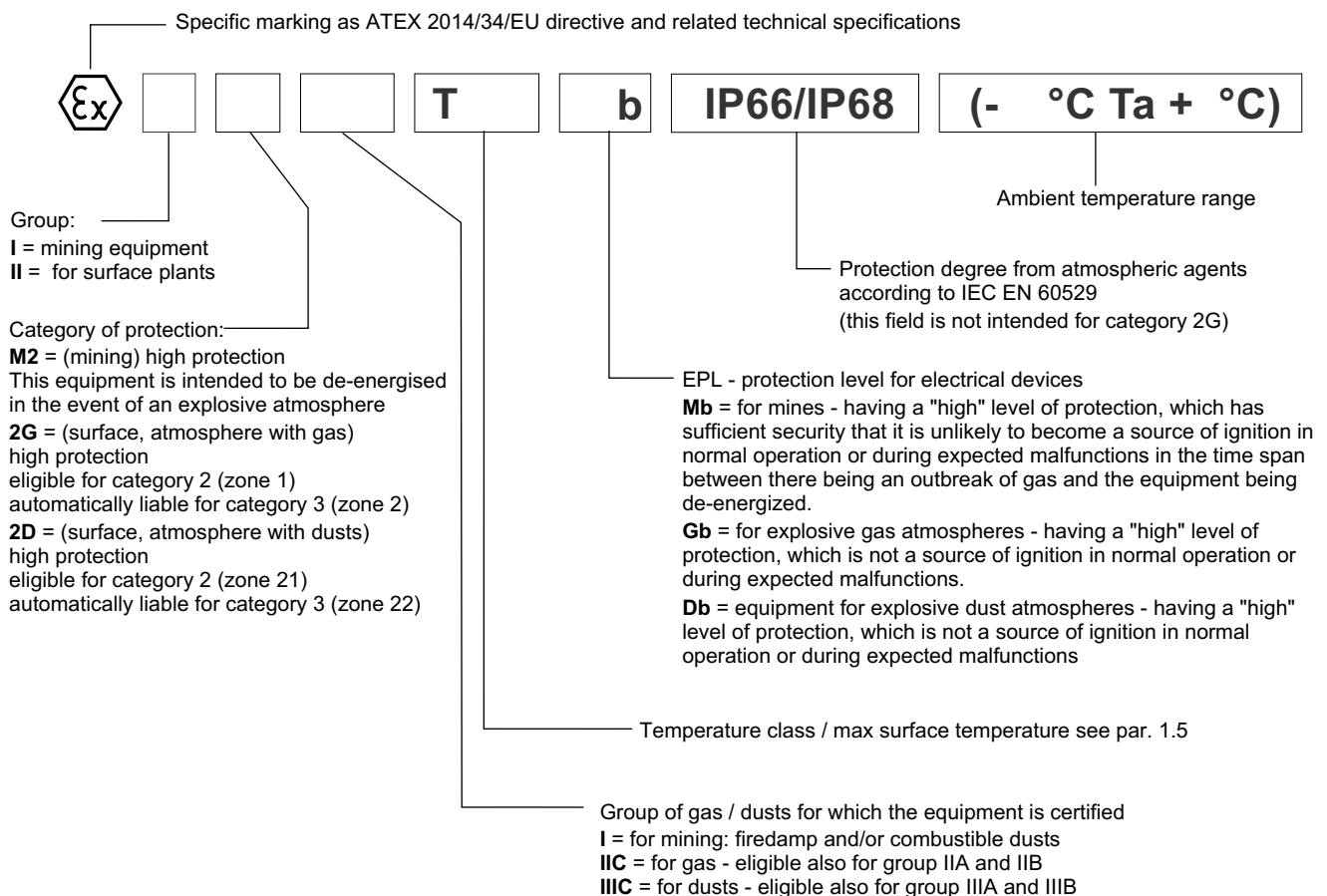
Type examination certificate: AR18ATEX055

The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

ATEX II 2G ATEX II 2D	*KD2	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur occasionally.
ATEX I M2	*KDM2	equipment intended for use in underground parts of mines as well as those parts of surface installations of such mines likely to be endangered by firedamp and/or combustible dust. This equipment is intended to be de-energised in the event of an explosive atmosphere.

1.2 - ATEX marking for valves

valve code		N and V seals	NL seals
*KD2	for gas	II 2G IIC T4 Gb (-20°C Ta +80°C)	II 2G IIC T4 Gb (-40°C Ta +80°C)
	for dusts	II 2D IIIC T154°C Db IP66/IP68 (-20°C Ta +80°C)	II 2D IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)
*KD2 /T5	for gas	II 2G IIC T5 Gb (-20°C Ta +55°C)	II 2G IIC T5 Gb (-40°C Ta +55°C)
	for dusts	II 2D IIIC T129°C Db IP66/IP68 (-20°C Ta +55°C)	II 2D IIIC T129°C Db IP66/IP68 (-40°C Ta +55°C)
*KDM2	mining	I M2 I T150°C Mb IP66/68 (-20°C Ta +75°C)	I M2 I T150°C Mb IP66/68 (-40°C Ta +75°C)










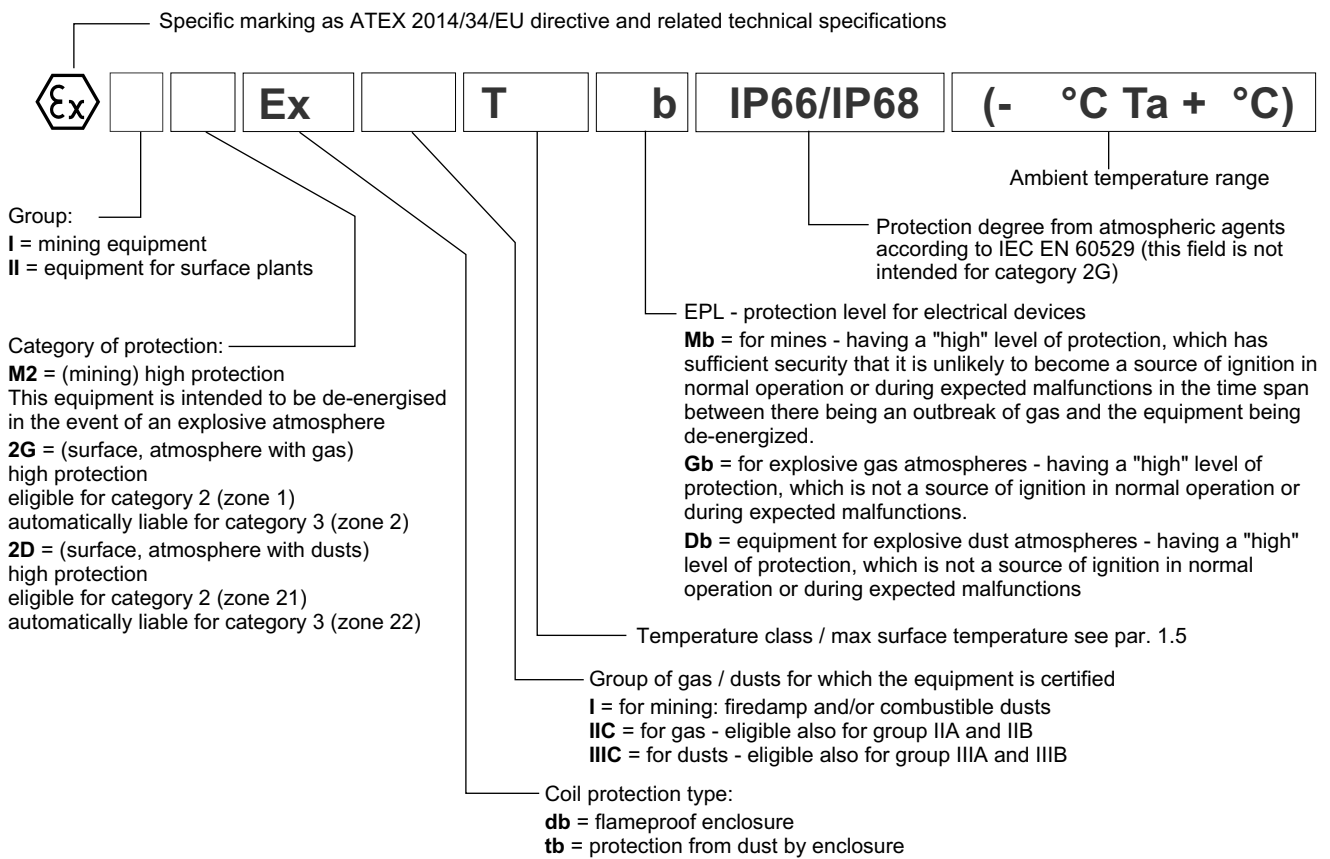
1.3 - ATEX classification of the coils

The coil of the explosion-proof valves is ATEX certified itself as such is identified with its own tag, carries the relative ATEX marking. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an "Ex db" type protection (explosion-proof coil).

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

1.4 - ATEX marking on coils

for valve type *KD2	for gas for dusts	 II 2G Ex db IIC T4 Gb (-40°C Ta +80°C)  II 2D Ex tb IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)
for valve type *KD2 /T5	for gas for dusts	 II 2G Ex db IIC T5 Gb (-40°C Ta +55°C)  II 2D Ex tb IIIC T129°C Db IP66/IP68 (-40°C Ta +55°C)
for valve type *KDM2	mining	 I M2 Ex db I T150°C Mb IP66/IP68 (-40°C Ta +75°C)



1.5 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

The valves in group II can also be used for less limiting temperature classes (surface temperature allowed higher).

		temperature range	N and V seals	NL seals	Temperature class	eligible also for
ATEX II 2G ATEX II 2D	*KD2	of ambient	-20 / +80 °C	-40 / +80 °C	T4 (gas) T154°C (dusts)	T3, T2, T1 T200°C and higher
		of fluid				
	*KD2 /T5	of ambient	-20 / +55 °C	-40 / +55 °C	T5 (gas) T129°C (dusts)	T4, T3, T2, T1 T135°C and higher
		of fluid				
ATEX I M2	*KDM2	of ambient	-20 / +75 °C	-40 / +75 °C	T150°C	-
		of fluid				



2 - IECEx CLASSIFICATION AND TEMPERATURES

The IECEx certification requires the classification of the electrical equipment only.

Diplomatic supplies valves with IECEx certified coils, suitable for application and installation in potentially explosive atmospheres. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an "Ex db" type protection (explosion-proof coil).

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

The supply always includes the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environment.

2.1 - IECEx classification

Certificate of conformity (CoC): IECEx TUN 15.0028X

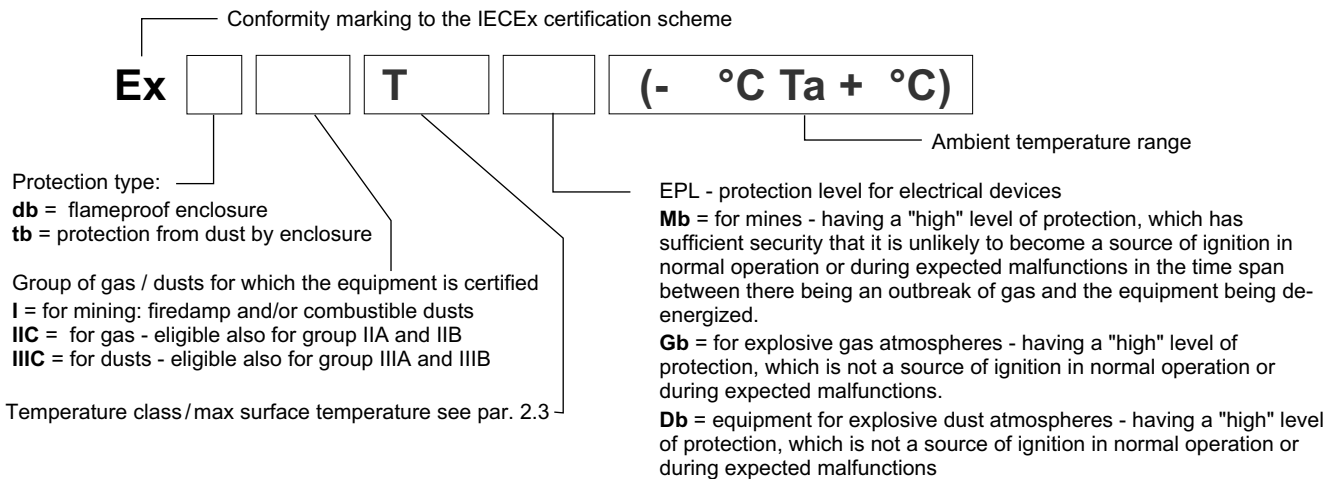
The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

IECEx Gb IECEx Db	*KXD2	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur occasionally.
IECEx Mb	*KXDM2	equipment intended for use in underground parts of mines as well as those parts of surface installations of such mines likely to be endangered by firedamp and/or combustible dust. This equipment is intended to be de-energised in the event of an explosive atmosphere.

2.2 - IECEx marking

There is a plate with the IECEx mark on each coil.

*KXD2 valves	for gas	Ex db IIC T4 Gb (-40°C Ta +80°C)
	for dusts	Ex tb IIIC T135°C Db (-40°C Ta +80°C)
*KXD2 /T5 valves	for gas	Ex db IIC T5 Gb (-40°C Ta +55°C)
	for dusts	Ex tb IIIC T100°C Db (-40°C Ta +55°C)
*KDM2 valves	mining	Ex db I Mb (-40°C Ta +80°C)



2.3 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

Valves for surface plants can also be used for less limiting temperature classes (higher surface temperature allowed).

		temperature range	N and V seals	NL seals	Temperature class	eligible also for
IECEx Gb IECEx Db	*KXD2	of ambient	-20 / +80 °C	-40 / +80 °C	T4 (gas) T135°C (dusts)	T3, T2, T1 T200°C and higher
		of fluid				
IECEx Gb IECEx Db	*KXD2 /T5	of ambient	-20 / +55 °C	-40 / +55 °C	T5 (gas) T100°C (dusts)	T4, T3, T2, T1 T135°C and higher
		of fluid				
IECEx Mb	*KXDM2	of ambient	-20 / +80 °C	-40 / +80 °C	-	-
		of fluid				



3 - INMETRO CLASSIFICATION AND TEMPERATURES

The INMETRO certification requires the classification of the electrical equipment only.

Diplomatic supplies valves with INMETRO certified coils, suitable for application and installation in potentially explosive atmospheres. The mechanical construction of the coil housing is made in order to ensure its resistance to possible internal explosion and to avoid any explosion propagation to the outside environment, matching an "Ex db" type protection (explosion-proof coil).

Moreover, the solenoid is designed to maintain its surface temperature below the limits specified to the relevant class.

The supply always includes the operating and maintenance manual, that contains all the information needed for a correct use of the valve in potentially explosive environment.

3.1 - INMETRO classification

Certificate of conformity: DNV 15.0094 X

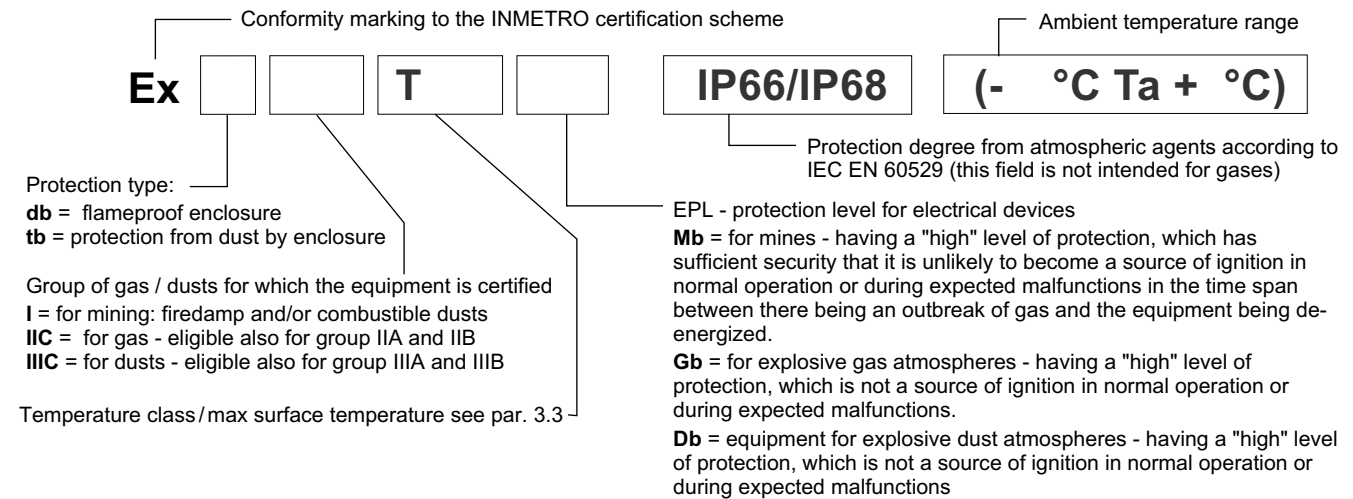
The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

INMETRO Gb INMETRO Db	*KBD2	equipment intended for use in areas in which explosive atmospheres caused by gases, vapours, mists or air/dust mixtures are likely to occur occasionally.
INMETRO Mb	*KBDM2	equipment intended for use in underground parts of mines as well as those parts of surface installations of such mines likely to be endangered by firedamp and/or combustible dust. This equipment is intended to be de-energised in the event of an explosive atmosphere.

3.2 - INMETRO marking

There is a plate with the INMETRO mark on each coil.

*KBD2 valves	for gas	Ex db IIC T4 Gb (-40°C Ta +80°C)
	for dusts	Ex tb IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)
*KBD2 /T5 valves	for gas	Ex db IIC T5 Gb (-40°C Ta +55°C)
	for dusts	Ex tb IIIC T129°C Db IP66/IP68 (-40°C Ta +55°C)
*KBDM2 valves	mining	Ex db I T150° Mb IP66/IP68 (-40°C Ta +75°C)



3.3 - Operating temperatures

These valves are classified according to their maximum surface temperature (EN 13463-1), which must be lower than the ignition temperature of the gases, vapors and dusts for which the area in which they will be used is classified.

Valves for surface plants can also be used for less limiting temperature classes (higher surface temperature allowed).

		temperature range	N and V seals	NL seals	Temperature class	eligible also for
INMETRO Gb INMETRO Db	*KBD2	of ambient	-20 / +80 °C	-40 / +80 °C	T4 (gas) T154°C (dusts)	T3, T2, T1 T200°C and higher
		of fluid				
INMETRO Db	*KBD2 /T5	of ambient	-20 / +55 °C	-40 / +55 °C	T5 (gas) T129°C (dusts)	T4, T3, T2, T1 T135°C and higher
		of fluid				
INMETRO Mb	*KBDM2	of ambient	-20 / +75 °C	-40 / +75 °C	T150°C	-
		of fluid				



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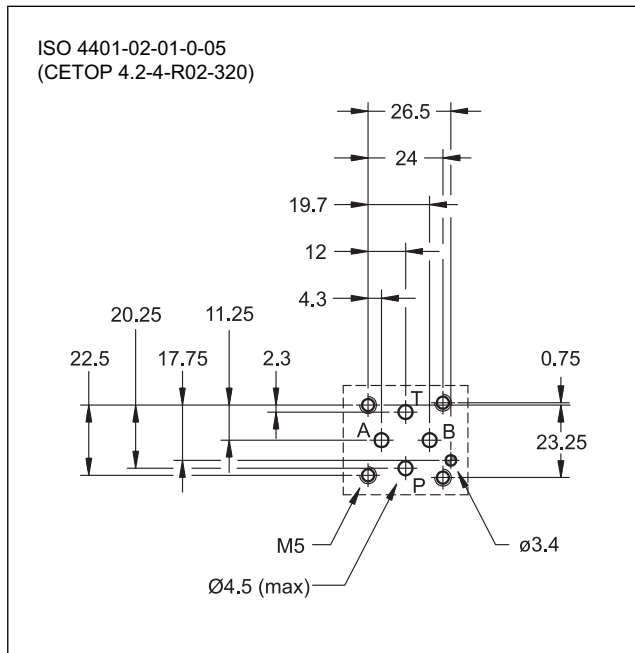
PRM2

DIRECT OPERATED PRESSURE RELIEF VALVE SERIES 10

MODULAR VERSION ISO 4401-02

p max 320 bar
Q max 20 l/min

MOUNTING SURFACE



OPERATING PRINCIPLE

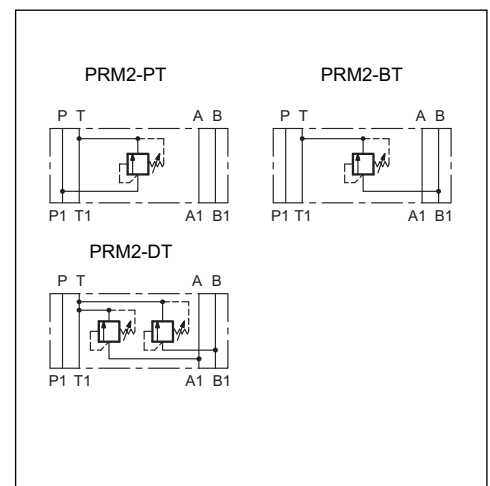
- The PRM2 valve is a direct operated pressure relief valve made as a modular version with mounting surface according to the ISO 4401 standards.
- It can be assembled with all ISO 4401-02 modular valves without use of pipes, using suitable tie-rods or bolts.
- It is available in versions for single relief on P or B with discharge in T, or two independent relief on A and B with discharge in T, all with three different pressure adjustment ranges.
- This valve is normally used as a hydraulic circuit pressure limiting device or as a limiting device of the pressure peaks generated during the movement of hydraulic actuators.
- It is supplied with a countersunk hex adjustment screw and locking nut.

PERFORMANCES

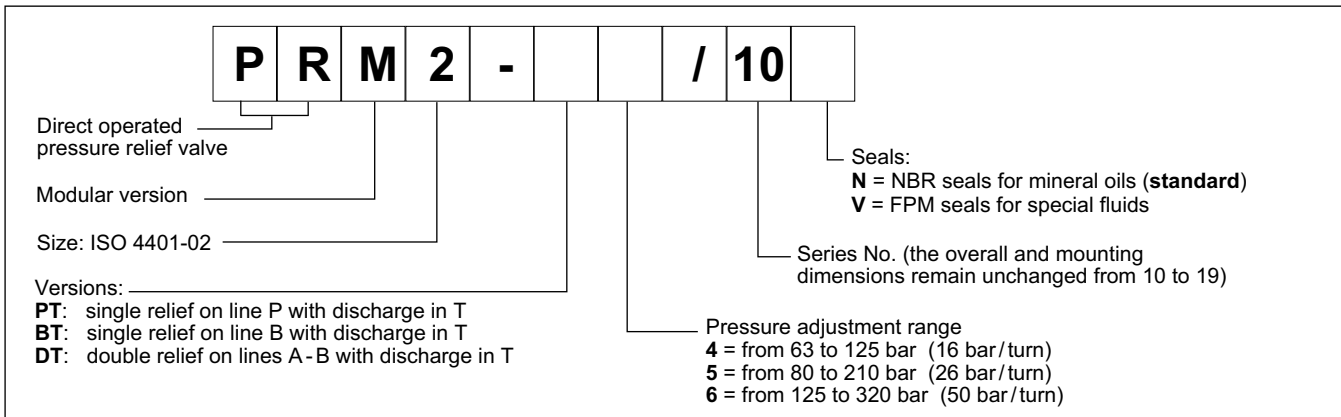
(measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	320
Minimum controlled pressure	see Δp diagram.	
Maximum flow rate	l/min	20
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass: PRM2-PT and PRM2-BT PRM2-DT	kg	0.85 1

HYDRAULIC SYMBOLS

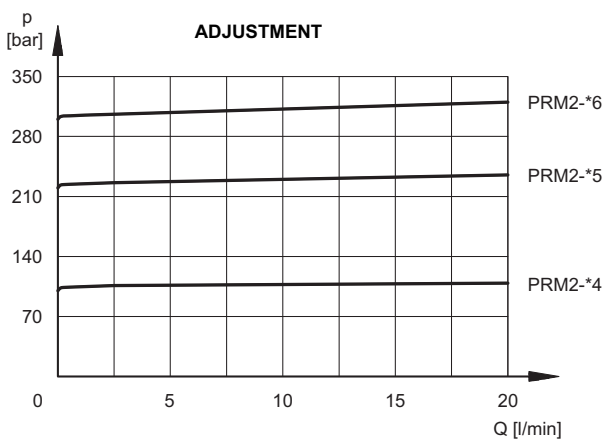


1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

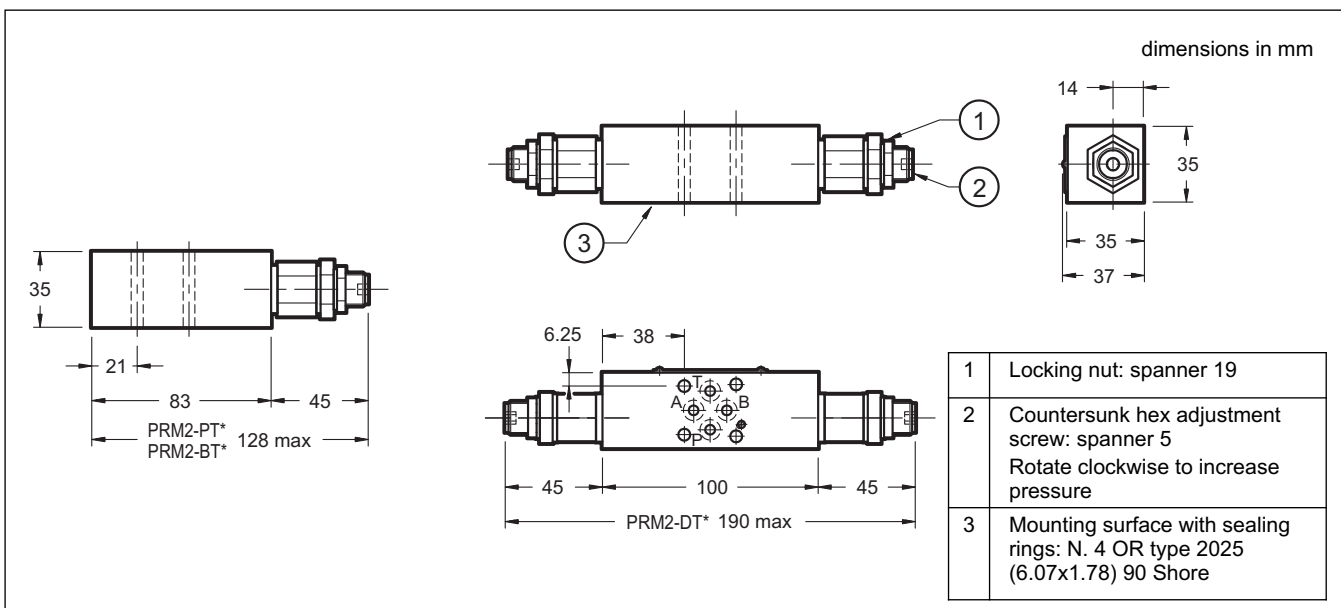
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V).

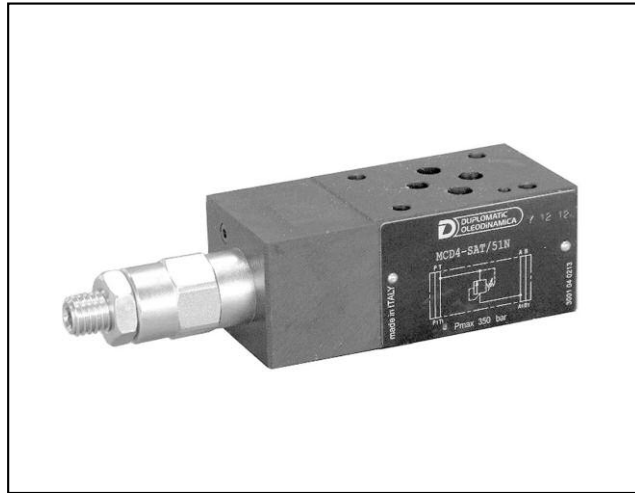
For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS





MCD

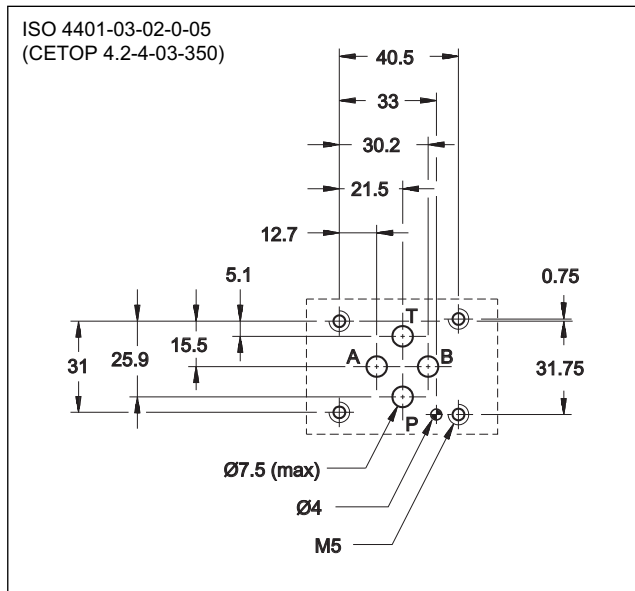
DIRECT OPERATED PRESSURE RELIEF VALVE

SERIES 51

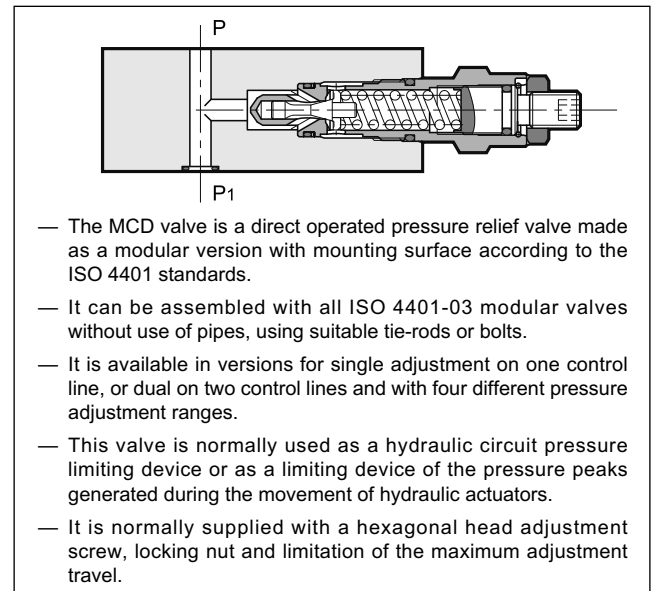
MODULAR VERSION ISO 4401-03

p max 350 bar
Q max (see table of performances)

MOUNTING INTERFACE



OPERATING PRINCIPLE



CONFIGURATIONS (see hydraulic symbols table)

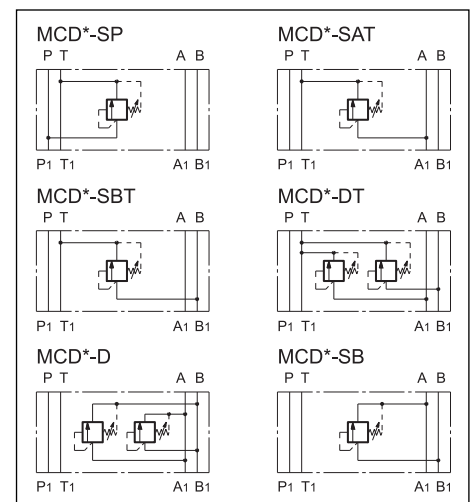
- “SP”: controls the pressure on line P with discharge in T
- “SAT”: controls the pressure on line A with discharge in T
- “SBT”: controls the pressure on line B with discharge in T

- “DT”: controls the pressure on lines A-B with discharge in T
- “D”: controls the pressure on lines A-B with crossed discharges
- “SB”: controls the pressure on line B with discharge in A

PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	350
Minimum controlled pressure	see Δp diagram	
Maximum flow rate in controlled lines	l/min	50
Maximum flow rate in the free lines		75
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass: MCD-SP / MCD-SAT / MCD-SBT / MCD-SB / MCD-DT / MCD-D	kg	1,4 2,0

HYDRAULIC SYMBOLS



1 - IDENTIFICATION CODE

M	C	D	-	/ 51	/
----------	----------	----------	----------	-------------	----------

Size: ISO 4401-03
Modular version

Direct operated pressure relief valve

Pressure adjustment range
2 = up to 25 bar **5** = up to 210 bar
3 = up to 70 bar **6** = up to 350 bar
4 = up to 140 bar

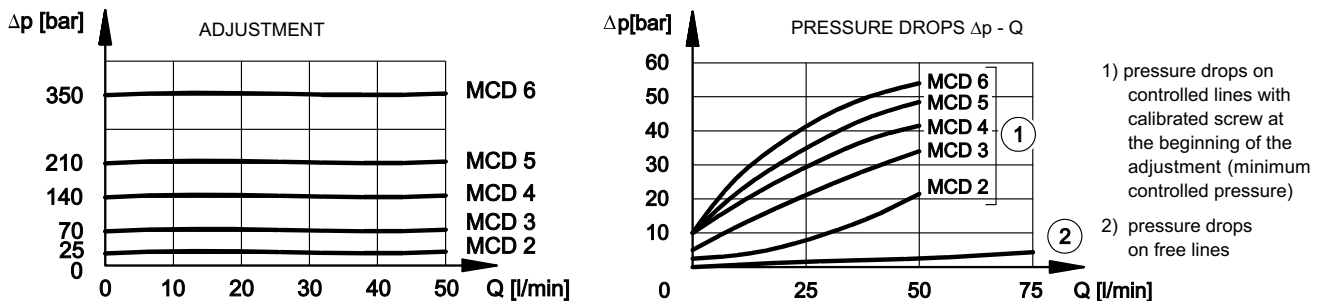
Omit for adjustment with countersunk hex screw - **standard**
K = Adjustment knob

Seals:
N = NBR seals for mineral oils (**standard**)
V = FPM seals for special fluids

Series No. (the overall and mounting dimensions remain unchanged from 50 to 59)

Configurations:
SP: single on line P with discharge in T
SAT: single on line A with discharge in T
SBT: single on line B with discharge in T
DT: double on lines A-B with discharge in T
D: double on lines A-B with crossed discharges
SB: single on line B with discharge in A

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

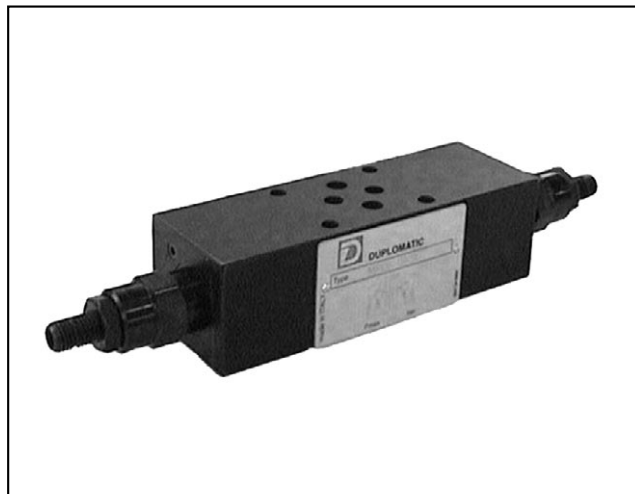
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

1	Locking nut: spanner 19
2	Countersunk hex adjustment screw: spanner 6 (standard) Rotate clockwise to increase pressure
3	Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) 90 Shore
4	Adjustment knob: K
5	Locking ring



MRQ

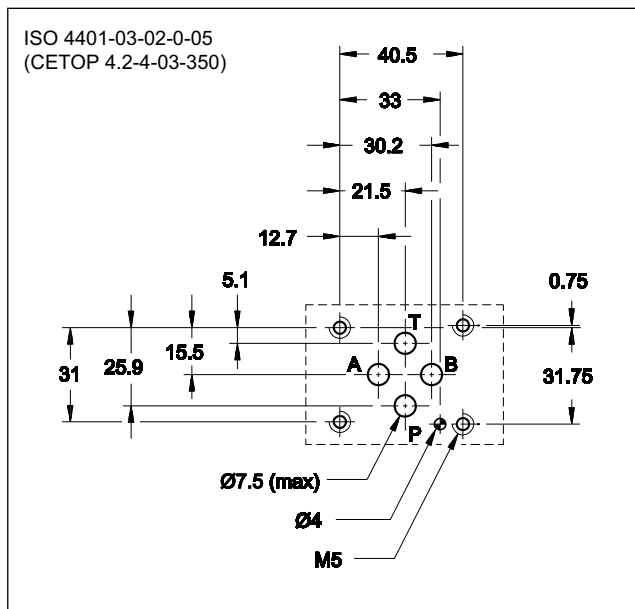
VÁLVULA REGULADORA DE PRESION PILOTADA

SERIE 51

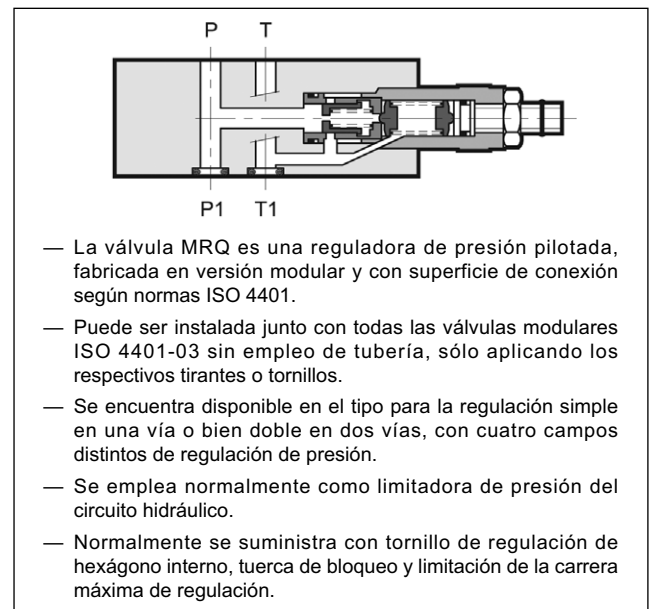
TIPO MODULAR
ISO 4401-03

p max **350** bar
Q max **75** l/min

PLANO DE ASIENTO



PRINCIPIO DE FUNCIONAMIENTO



VERSIONES (ver tabla Símbolos Hidráulicos)

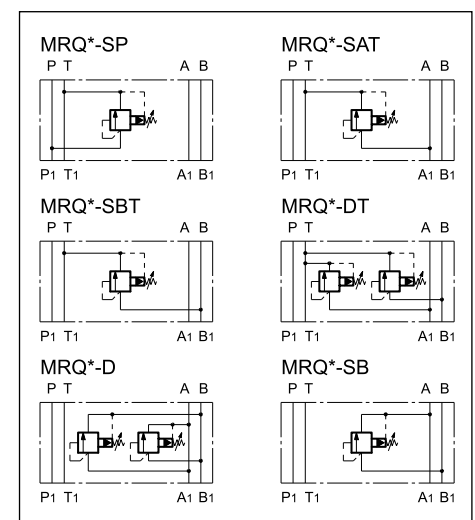
- Versión "SP": regula la presión en la vía P con descarga en T.
- Versión "SAT": regula la presión en la vía A con descarga en T.
- Versión "SBT": regula la presión en la vía B con descarga en T.

- Versión "DT": regula la presión en las vías A-B con descarga en T.
- Versión "D": regula la presión en las vías A-B con descargas cruzadas.
- Versión "SB": regula la presión en la vía B con descarga en A.

PRESTACIONES (medidas con aceite mineral de viscosidad 36 cSt a 50°C)

Presión máxima de trabajo	bar	350
Presión mínima regulada	ver diagrama Δp-Q	
Caudal máximo en el conducto controlado y en los conductos libres	l/min	75
Campo temperatura ambiente	°C	-20 / +60
Campo temperatura fluido	°C	-20 / +80
Campo viscosidad fluido	cSt	10 ÷ 400
Grado de contaminación del fluido	según ISO 4406:1999 clase 20/18/15	
Viscosidad recomendada	cSt	25
Masa: MRQ-SP / MRQ-SAT / MRQ-SBT / MRQ-SB MRQ - DT / MRQ- D	kg	1,4 2,1

SIMBOLOS HIDRAULICOS



1 - CÓDIGO DE IDENTIFICACIÓN

M	R	Q	-	/	/	51	/
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Tamaño nominal ISO 4401-03. Tipo modular

Válvula reguladora de presión pilotada

Campo de regulación de la presión:
3 = hasta 70 bar **5** = hasta 210 bar
4 = hasta 140 bar **6** = hasta 350 bar

Versiones:

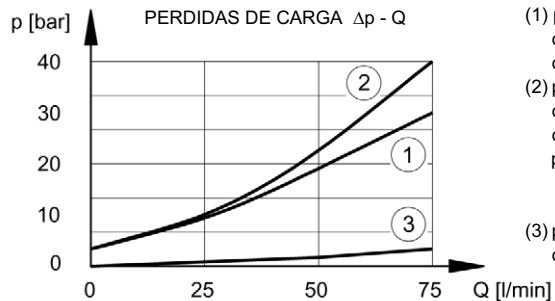
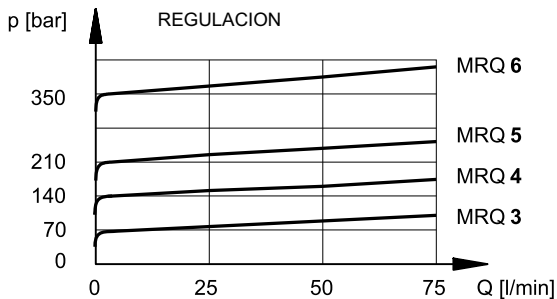
SP: simple en la vía P con descarga en T. **DT**: doble en las vías A-B con descarga en T.
SAT: simple en la vía A con descarga en T. **D**: doble en las vías A-B con descargas cruzadas.
SBT: simple en la vía B con descarga en T. **SB**: simple en la vía B con descarga en A.

Tipo de juntas: omitir para aceites minerales
V = vitón para fluidos especiales

N. de serie (entre 50 y 59 las dimensiones y el espacio para instalación permanecen invariables)

M1 = empuñadura de regulación (omitir para regulación por tornillo de hexágono interno)

2 - CURVAS CARACTERISTICAS (valores obtenidos con viscosidad 36 cSt a 50°C)



- (1) pérdidas de carga conductos controlados
- (2) pérdidas de carga conductos controlados sólo para MRQ*-D MRQ*-SB
- (3) pérdidas de carga conductos libres

3 - FLUIDOS HIDRAULICOS

Usar fluidos hidráulicos a base de aceite mineral tipo HL o HM según ISO 6743-4. Para esos tipos de fluidos, usar juntas en NBR (código N). Para fluidos tipo HFDR (ésteres fosfóricos) utilizar juntas en FPM (código V). Para el uso de otros tipos de fluidos, como HFA, HFB, HFC consultar con nuestra Oficina Técnica.

El uso con fluido a temperatura superior a 80° determina una precoz disminución de las propiedades del fluido y de las juntas. El fluido debe mantener intactas sus propiedades físicas y químicas.

4 - DIMENSIONES PARA LA INSTALACIÓN

dimensiones en mm

1	Tuerca de bloqueo: llave 17
2	Tornillo de regulación de hexágono interno: llave 5. Rotación horaria para aumentar la presión
3	Superficie de montaje con juntas tóricas: N. 4 OR tipo 2037 (9.25x1.78) 90 Shore
4	Empuñadura de regulación: M1



PRM5

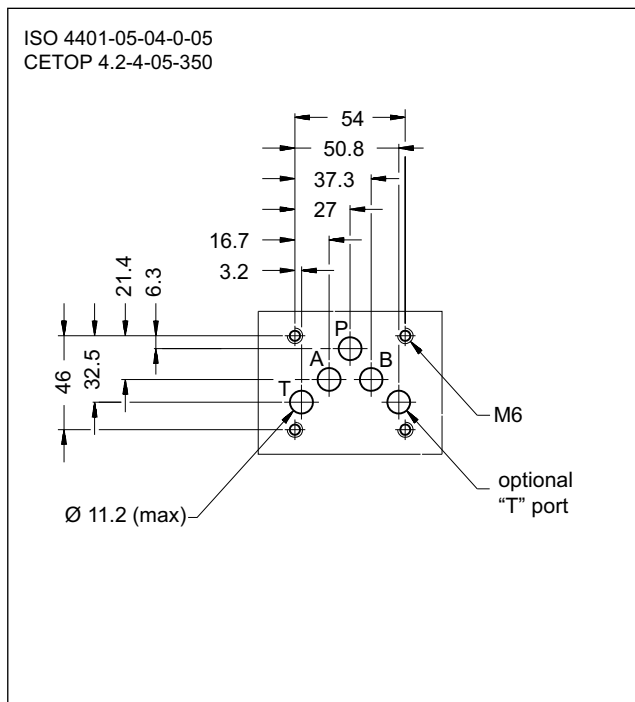
PILOT OPERATED PRESSURE RELIEF VALVE

SERIES 10

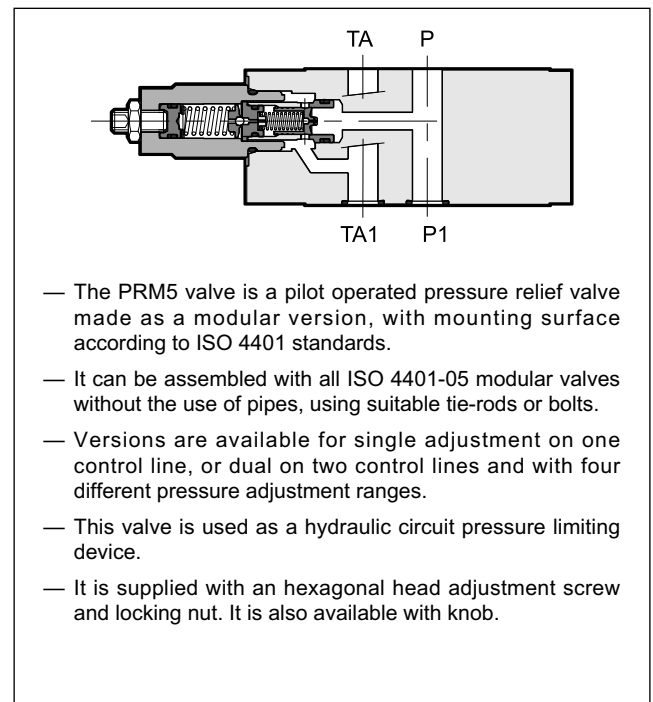
MODULAR VERSION ISO 4401-05

p max 350 bar
Q max 120 l/min

MOUNTING SURFACE



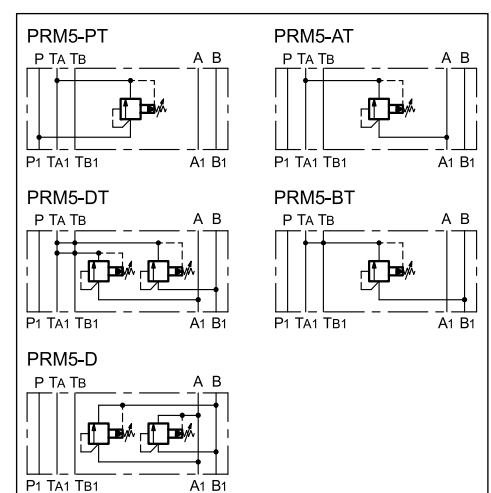
OPERATING PRINCIPLE



PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	350
Minimum controlled pressure	bar	see $\Delta p - Q$ diagram
Max flow	l/min	120
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass: PRM5-PT, -AT, -BT PRM5-DT, -D	kg	2,8 3

HYDRAULIC SYMBOLS



1 - IDENTIFICATION CODE

P	R	M	5	-	/	10	/	
----------	----------	----------	----------	---	---	-----------	---	--

Pilot operated pressure relief valve
 Modular version
 ISO 4401-05 size

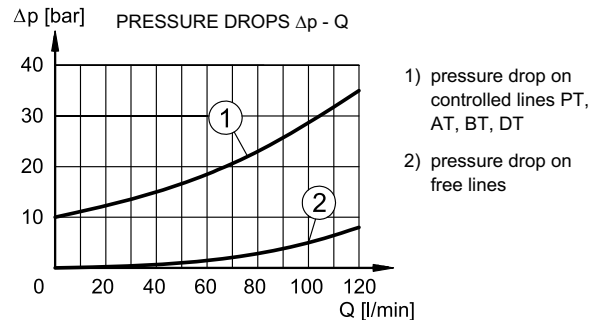
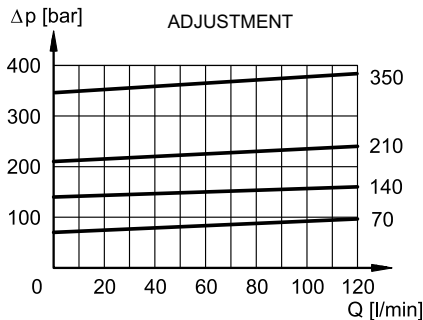
Versions:
PT: single on line P with discharge in TA
AT: single on line A with discharge in TA
BT: single on line B with discharge in TA and TB
DT: double on lines A-B with discharge in TA and TB
D: double on lines A-B with cross discharge

Pressure adjustment range:
070 = 14 ÷ 70 bar (17 bar/turn) **210** = 14 ÷ 210 bar (47 bar/turn)
140 = 14 ÷ 140 bar (32 bar/turn) **350** = 14 ÷ 350 bar (78 bar/turn)

Option: W7 surface treatment. Omit if not required (**NOTE**)
 Option: **K** = Adjustment knob. Omit for adjustment with hex socket screw (**standard**)
 Seals:
N = NBR seals for mineral oils (**standard**)
V = FPM seals for special fluids
 Series No. (the overall and mounting dimensions remain unchanged from 10 to 19)

NOTE: Upon request we can supply these valves completely with zinc-nickel surface treatment on the body. Add the suffix **/W7** at the end of the identification code.

2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

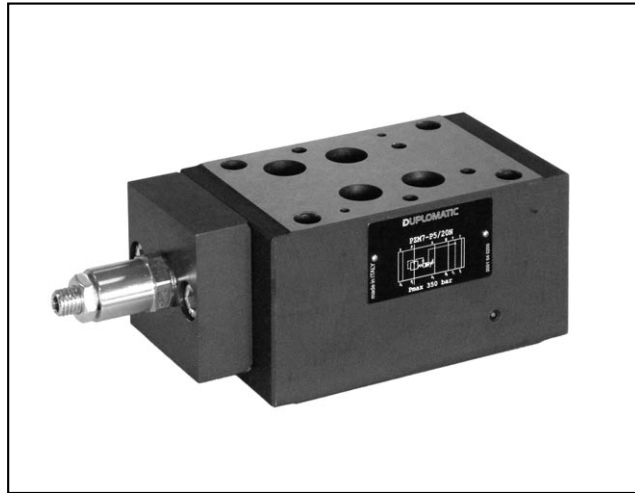
4 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

K VERSION

MAX 62

1	Socket hex adjustment screw: Hex key 4. Rotate clockwise to increase pressure
2	Locking nut: spanner 13
3	Mounting surface with sealing rings: 5 OR type 2050 (12.42 x 1.78) 90 Shore



PRM7

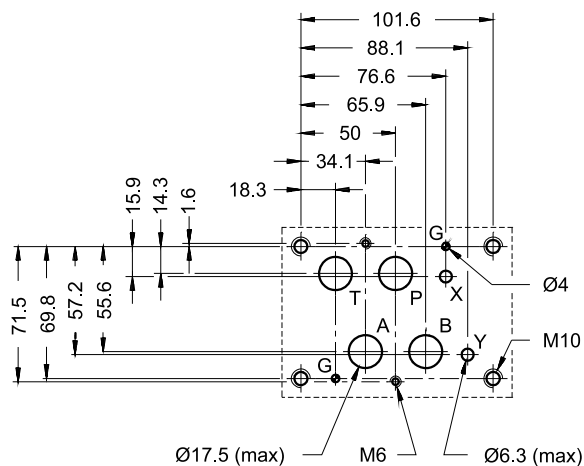
PRESSURE RELIEF VALVE, PILOT OPERATED SERIES 20

MODULAR VERSION ISO 4401-07

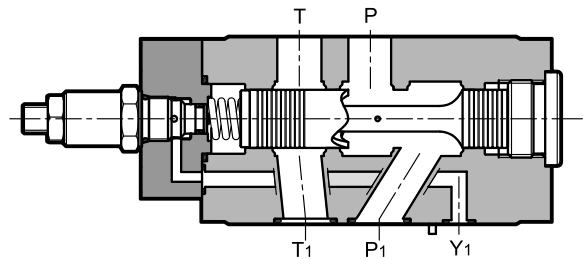
p max 350 bar
Q max 300 l/min

MOUNTING INTERFACE

ISO 4401-07-07-0-05
(CETOP 4.2-4-07)



OPERATING PRINCIPLE



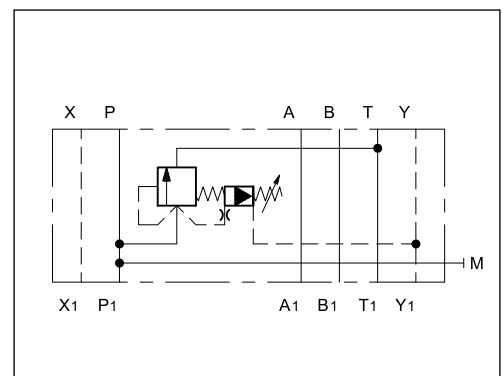
- The PMR7 valve is a pilot operated pressure relief valve made as a modular version with a mounting surface according to ISO 4401-07 standards.
- It can be assembled with all ISO 4401-07 modular valves without the use of pipes, using suitable tie-rods or bolts.
- This valve is used as a hydraulic circuit pressure limiting device.
- It is available with pressure adjustment on port P and relief in T, and five pressure adjustment ranges.
- It is supplied with an adjustment screw. The knob is available as option.

PERFORMANCES

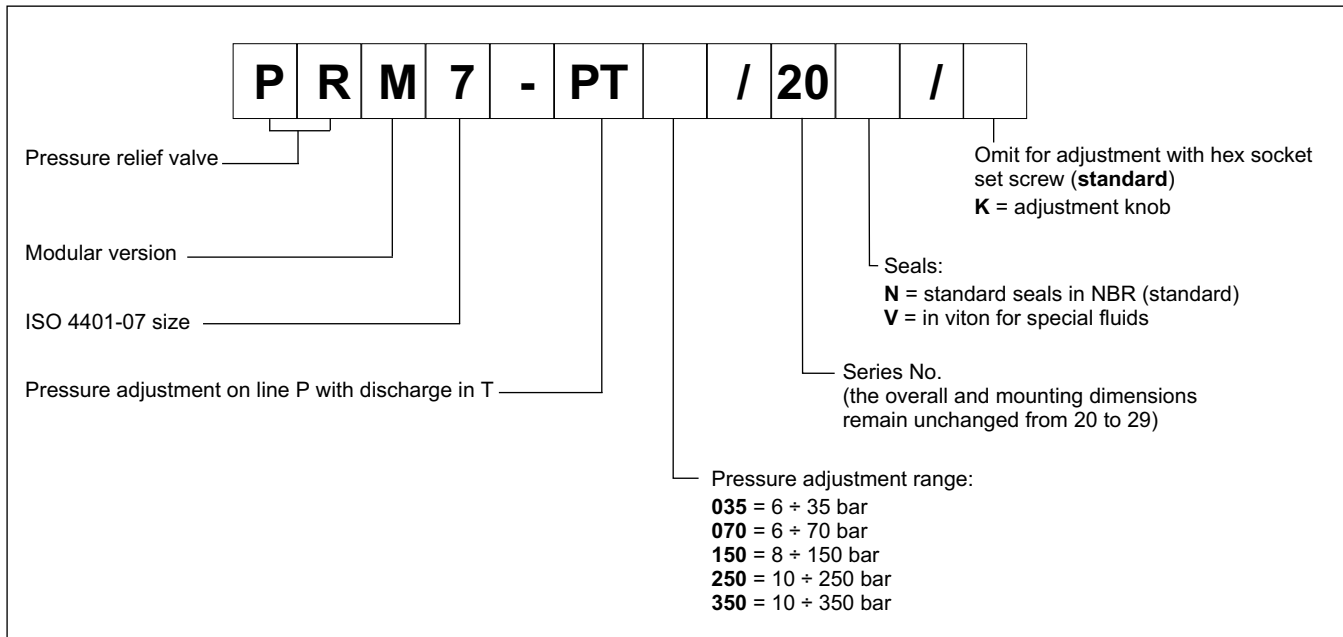
(measured with mineral oil of viscosity 36 cSt at 50°C)

Maximum operating pressure	bar	350
Maximum flow rate	l/min	300
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	7,5

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE



3 - HYDRAULIC FLUIDS

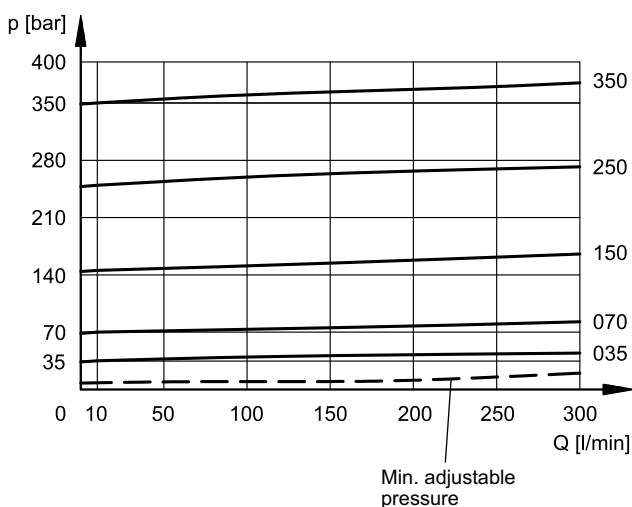
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

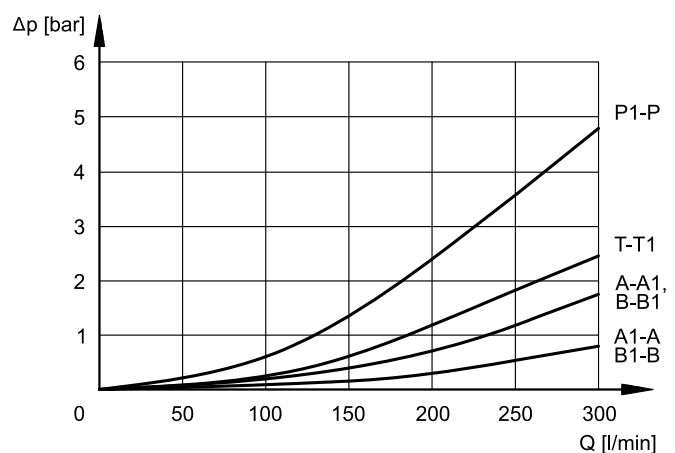
2 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)

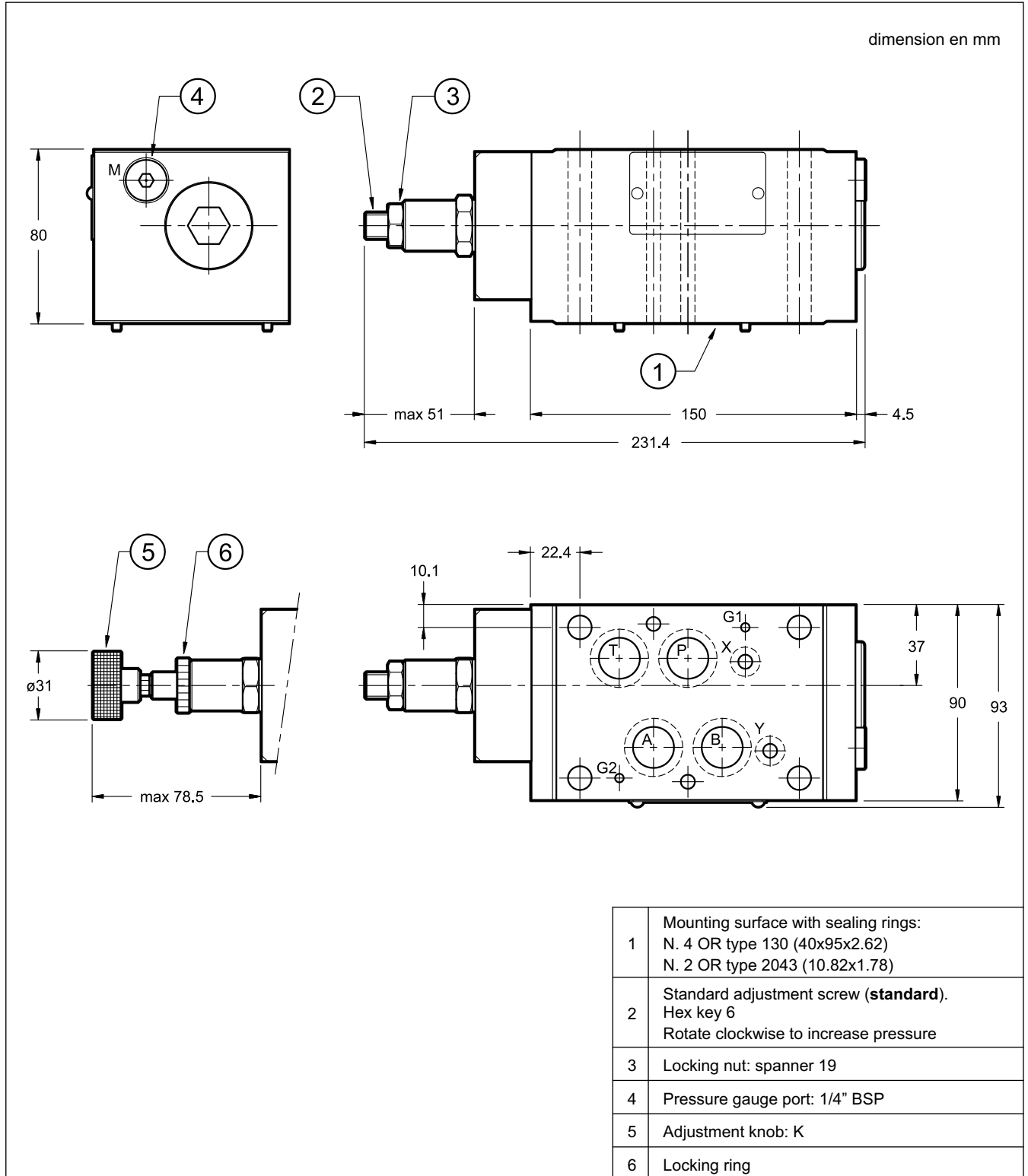
ADJUSTMENT



PRESSURE DROPS Δp - Q



4 - OVERALL AND MOUNTING DIMENSIONS





PRM7

SERIES 20



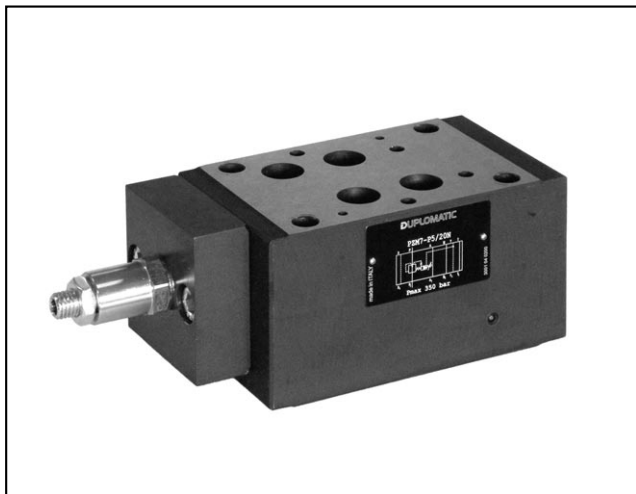
DIPLOMATIC MS S.p.A.

via M. Re Depaolini 24 • 20015 PARABIAGO (MI) • ITALY
tel. +39 0331.895.111 • www.diplomatic.com • e-mail: sales.exp@diplomatic.com

PZM7

PRESSURE REDUCING VALVE

SERIES 20

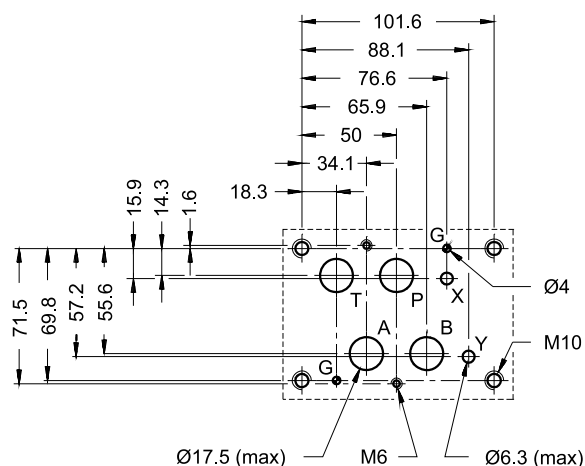


MODULAR VERSION ISO 4401-07

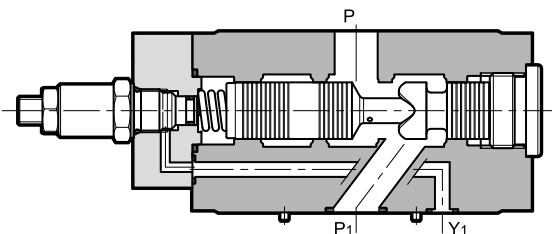
p max 350 bar
Q max 300 l/min

MOUNTING INTERFACE

ISO 4401-07-07-0-05
(CETOP 4.2-4-07)



OPERATING PRINCIPLE



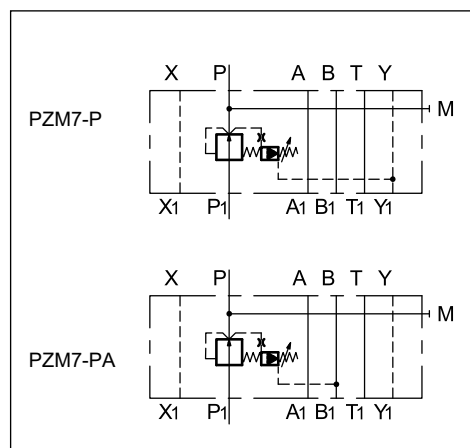
- PZM7 valves are pressure reducing valves for stack mounting, with mounting surface according to ISO 4401-07 standard.
- They are two-stage valves and are employed to assure stability of the controlled pressure, even changing the flow that passes through the valve.
- The PZM7 valves can be assembled quickly under DSP7 directional valves (see catalogue 41 420), without use of pipes, using suitable tie-rods or bolts, forming compact modular groups.
- They are supplied with adjustment screw. Knob is available as option.

PERFORMANCES

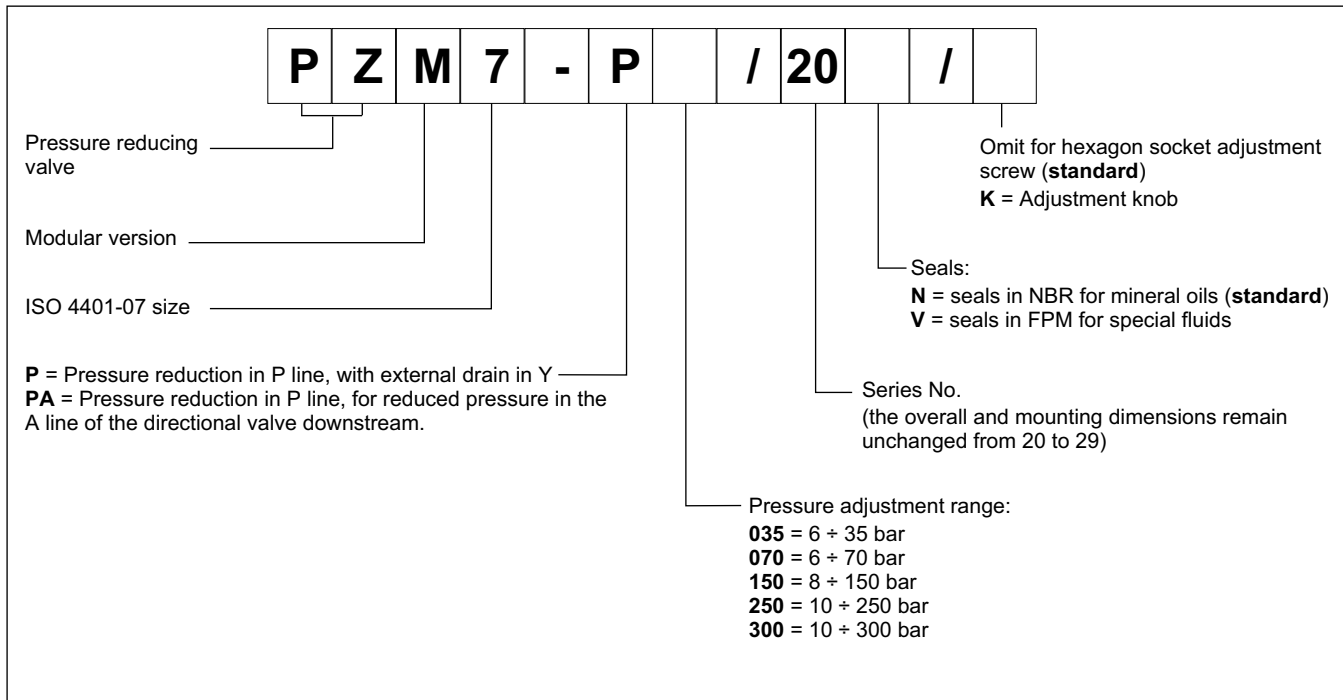
(measured with mineral oil of viscosity 36 cSt at 50 °C)

Maximum operating pressure	bar	350
Maximum flow rate	l/min	300
Drainage flow rate	l/min	≤ 0.9
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 + 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	7.5

HYDRAULIC SYMBOLS



1 - IDENTIFICATION CODE



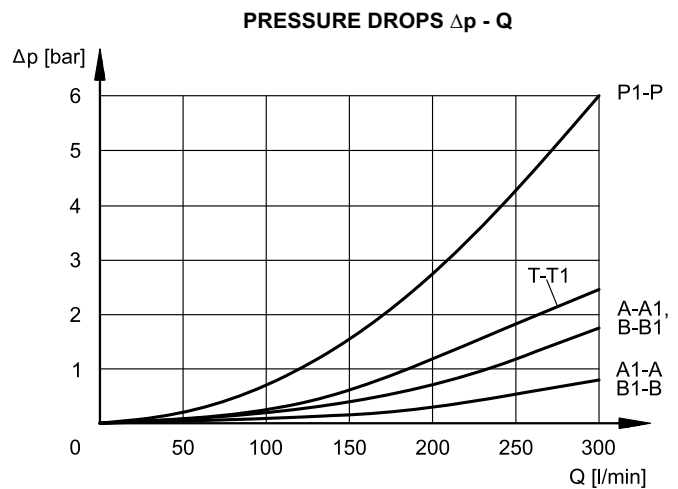
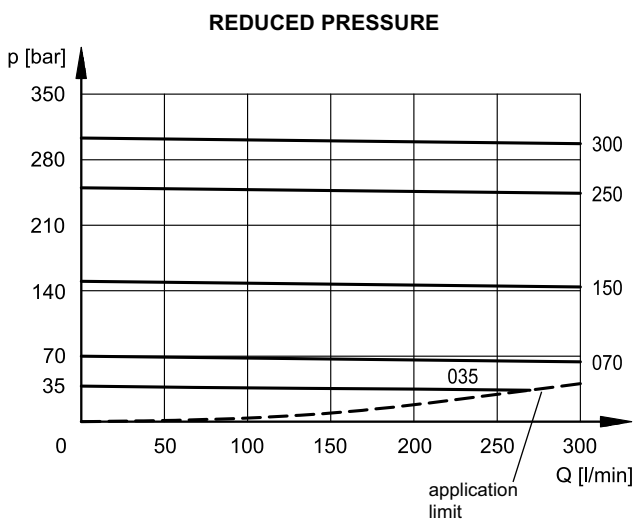
2 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

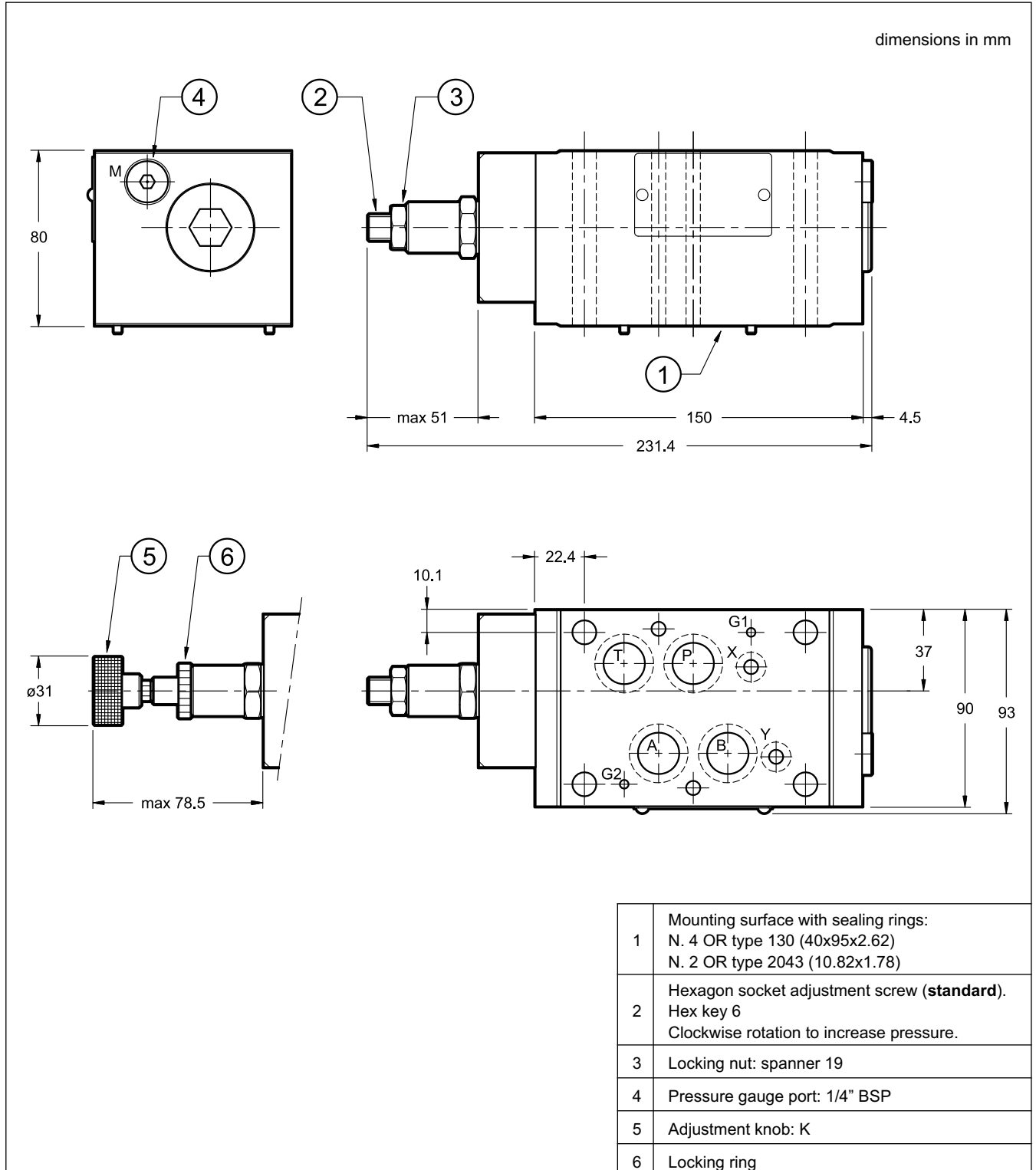
3 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)



Reduced pressure in P obtained for each adjustment range, with inlet pressure 350 bar and inlet flow 350 l/min.

4 - OVERALL AND MOUNTING DIMENSIONS





PZM7

SERIES 20



DIPLOMATIC MS S.p.A.

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MZD

DIRECT OPERATED THREE-WAY PRESSURE REDUCING VALVE WITH FIXED OR VARIABLE ADJUSTMENT

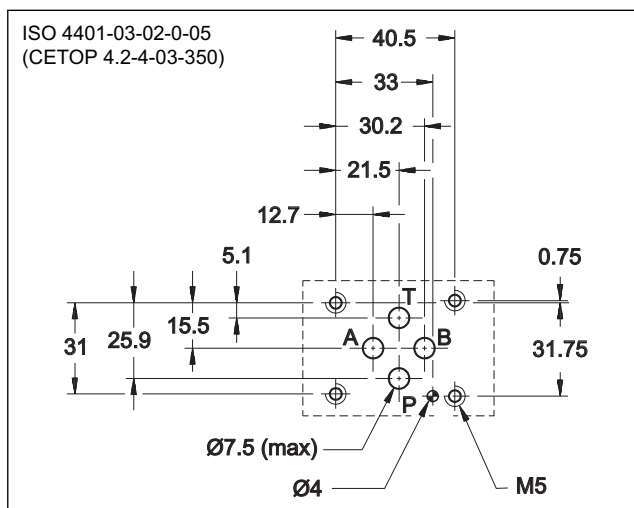


MODULAR VERSION ISO 4401-03

p max **350** bar

Q max (see table of performances)

MOUNTING INTERFACE



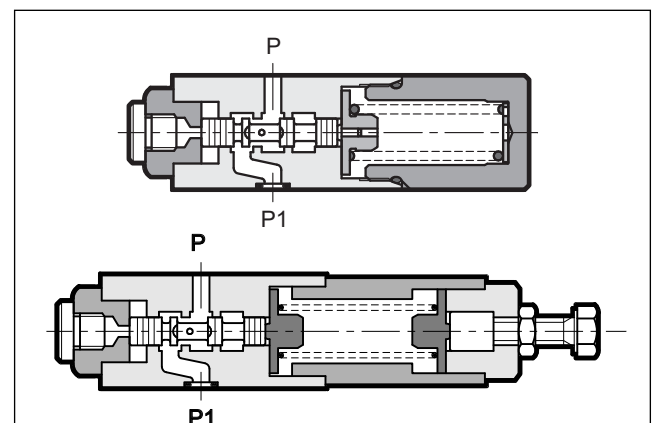
CONFIGURATIONS (see hydraulic symbols at par.1)

- MZD*: pressure reduction on line P, drainage connected with line T.
- MZD*/A and MZD*/RA: pressure reduction on line A toward the actuator and maximum pressure in line B, drainage connected with line T.
- MZD*/B and MZD*/RB: pressure reduction on line B toward the actuator and maximum pressure in line A, drainage connected with line T.

PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	350
Maximum pressure on port T		10
Maximum flow rate in the controlled lines	l/min	50
Maximum flow rate in the free lines		75
Drainage flow rate		≤ 0,08
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	1,4

OPERATING PRINCIPLE



— The MZD valve is a three-way spool type direct operated pressure reducing valve. It is normally open in the rest position and the hydraulic fluid passes freely from the P1 line to the P line.

The spool is subjected to the line P pressure on one side, and on the other side by the adjustment spring. When the pressure in line P exceeds the value set by the spring, the valve closes until the pressure in P (reduced) equals the calibrated value.

— The valve construction provides good adjustment sensitivity with reduced drainage flow. The drainage is connected to line T inside the valve.

— The three-way design provides protection of the secondary circuit from pressure surges since it allows a reverse flow from the actuator to the T discharge line.

— It is made as a modular version with ports according to the ISO 4401 standards and can be assembled quickly, without use of pipes, under the ISO 4401-03 solenoid valves.

— The variable adjustment version is supplied with a hexagonal head adjustment screw. Upon request, it can be equipped with a SICBLOC adjustment knob.

— The fixed adjustment version is available set at value 20, 25 or 30 bar pressure.

1 - IDENTIFICATION CODE OF MZD VARIABLE ADJUSTMENT VERSION

M	Z	D	/	/	/	/
----------	----------	----------	----------	----------	----------	----------

Size: ISO 4401-03 modular version

Direct operated pressure reducing valve

Pressure adjustment range:

2 = 3 ÷ 35 bar **4** = 30 ÷ 140 bar
3 = 10 ÷ 70 bar **5** = 50 ÷ 280 bar

Configurations (omit for MZD with pressure reduction on line P and regulation unit on side B)

- A:** pressure reduction on line A and full pressure on line B with regulation unit on side B
- B:** pressure reduction on line B and full pressure on line A with regulation unit on side B
- RP:** pressure reduction on line P with regulation unit on side A
- RA:** pressure reduction on line A and full pressure on line B with regulation unit on side A
- RB:** pressure reduction on line B and full pressure on line A with regulation unit on side A

Seals:
omit for mineral oils
V = viton for special fluids

Series No.:
50 - for MZD*, MZD*/RP, MZD*/A, MZD*/RA, MZD*/B valves
51 - for MZD*/RB valves
(the overall and mounting dimensions remain unchanged from 50 to 59)

M = Adjustment with SICBLOC knob
(omit for adjustment with hexagonal head screw)

Hydraulic symbols

MZD*
MZD*/RP

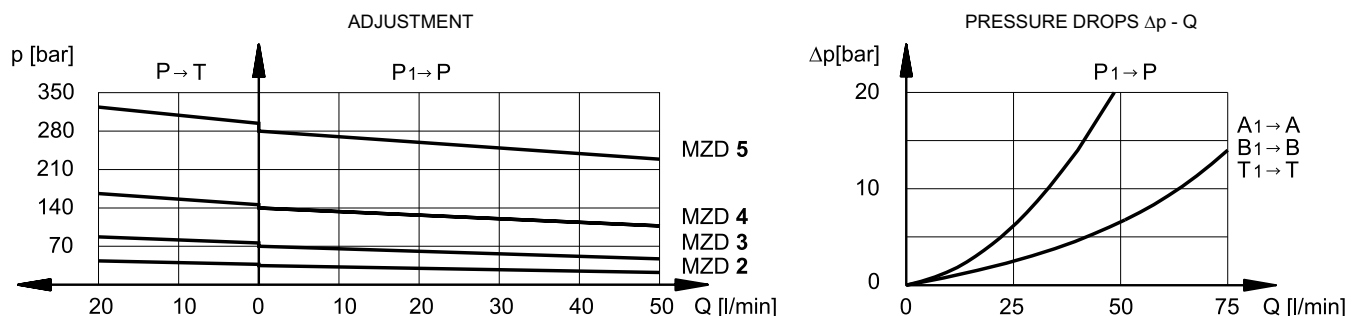
MZD*/A
MZD*/RA

MZD*/B
MZD*/RB

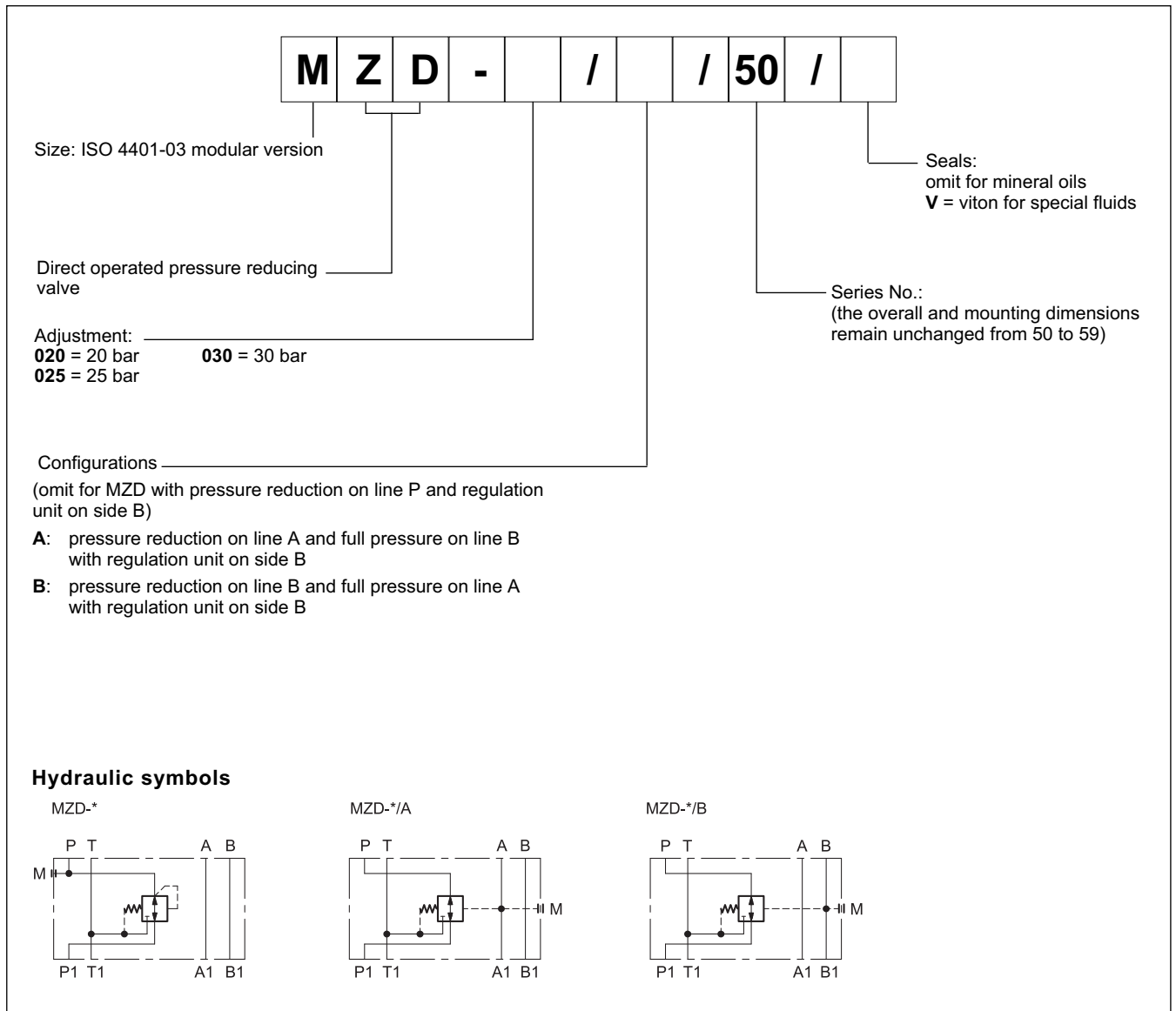
NOTE: the versions RP, RA and RB have been realised with regulation unit on side A, so as to be interchangeable with valves produced by other companies.
The standard version is equipped with regulation unit on side B.

2 - MZD VARIABLE ADJUSTMENT VERSION CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)



3 - IDENTIFICATION CODE OF MZD FIXED ADJUSTMENT VERSION



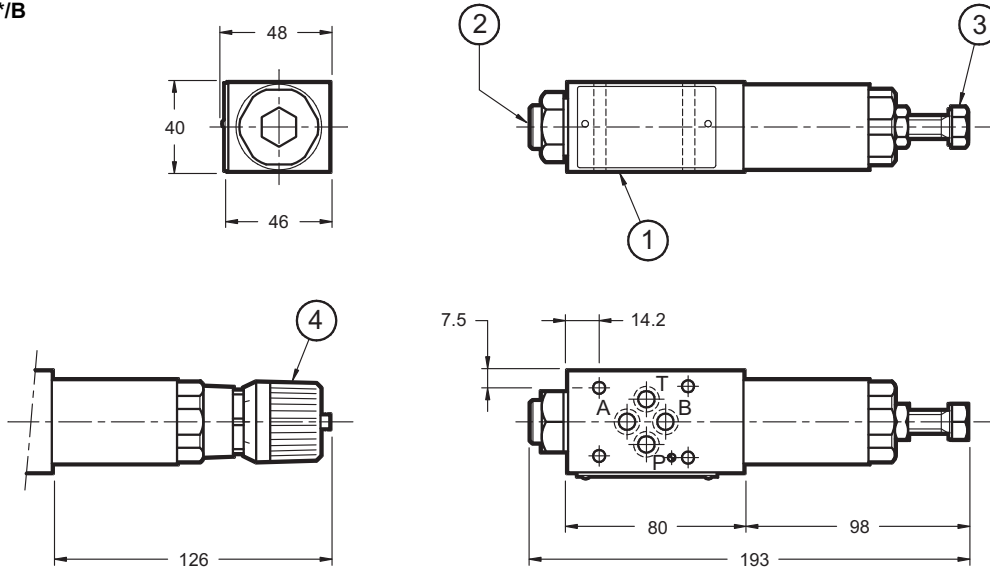
4 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

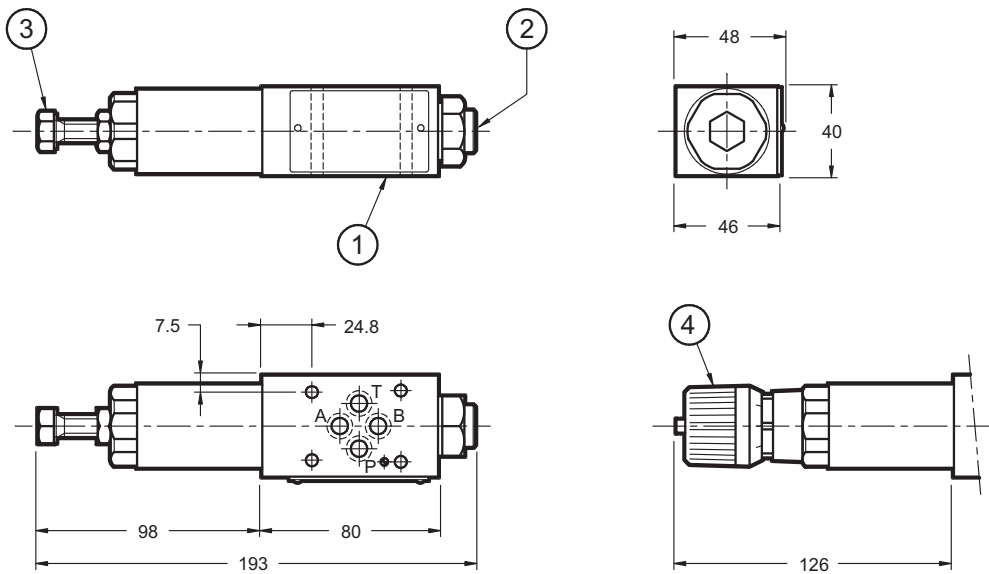
Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

5 - OVERALL AND MOUNTING DIMENSIONS VARIABLE ADJUSTMENT VERSION

MZD*
MZD*/A
MZD*/B



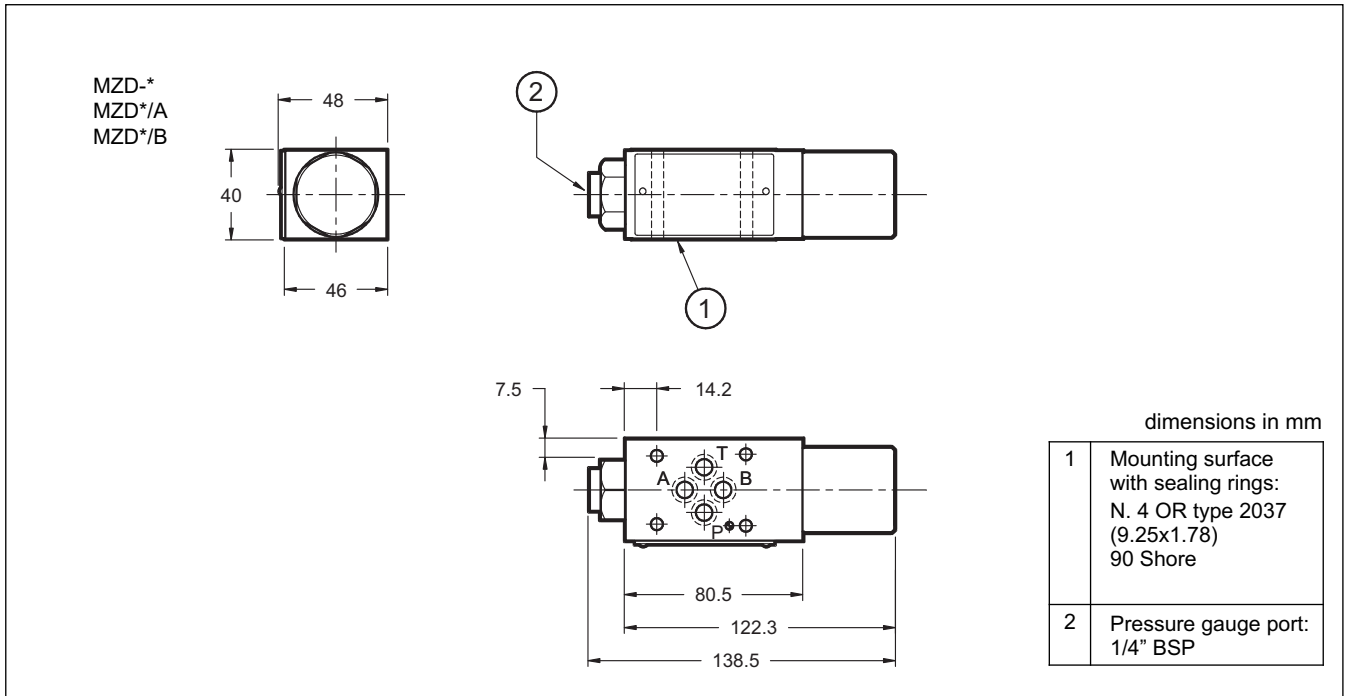
MZD*/RP
MZD*/RA
MZD*/RB



dimensions in mm

1	Mounting surface with sealing rings: 4 OR type 2037 (9.25x1.78) 90 Shore
2	Pressure gauge port 1/4" BSP
3	Hexagonal head adjustment screw. Spanner 17. Rotate clockwise to increase pressure
4	SICBLOC knob. To operate, push and rotate at the same time.

6 - OVERALL AND MOUNTING DIMENSIONS FIXED ADJUSTMENT VERSION



PZM2

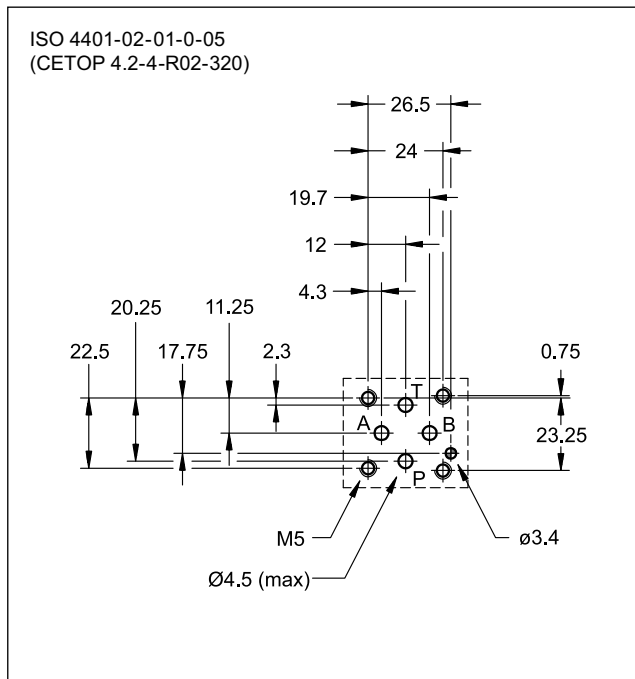
PRESSURE REDUCING VALVE DIRECT OPERATED WITH VARIABLE ADJUSTMENT SERIES 21



MODULAR VERSION ISO 4401-02

p max 320 bar
Q max 20 l/min

MOUNTING SURFACE



OPERATING PRINCIPLE

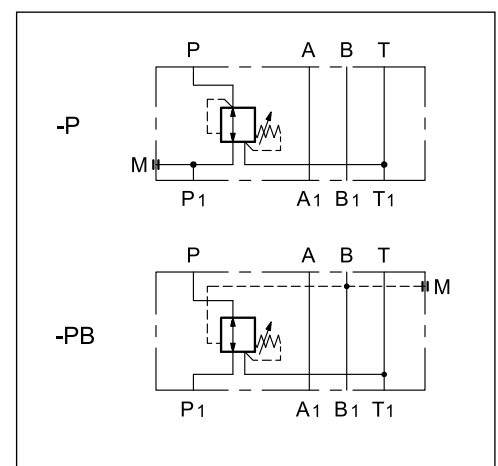
- The PZM2 valve is a three-ports pressure reducing valve, direct operated, spool type, made as modular version, with ports according to the ISO 4401 standards and can be assembled quickly, without use of pipes, under the ISO 4401-02 solenoid valves.
- The PZM2 is a normally open valve. The hydraulic fluid flows freely in the pressure line. When the inlet pressure in P exceeds the value set by the spring, the valve opens the outlet port to the tank line until the outlet pressure has been reduced to the set value.
- The valve construction provides good adjustment sensitivity with reduced drainage flow. The drainage to the tank line is internal.
- The three-ports design provides protection of the secondary circuit from pressure surges since it allows a reverse flow from the actuator to the tank line.

PERFORMANCES

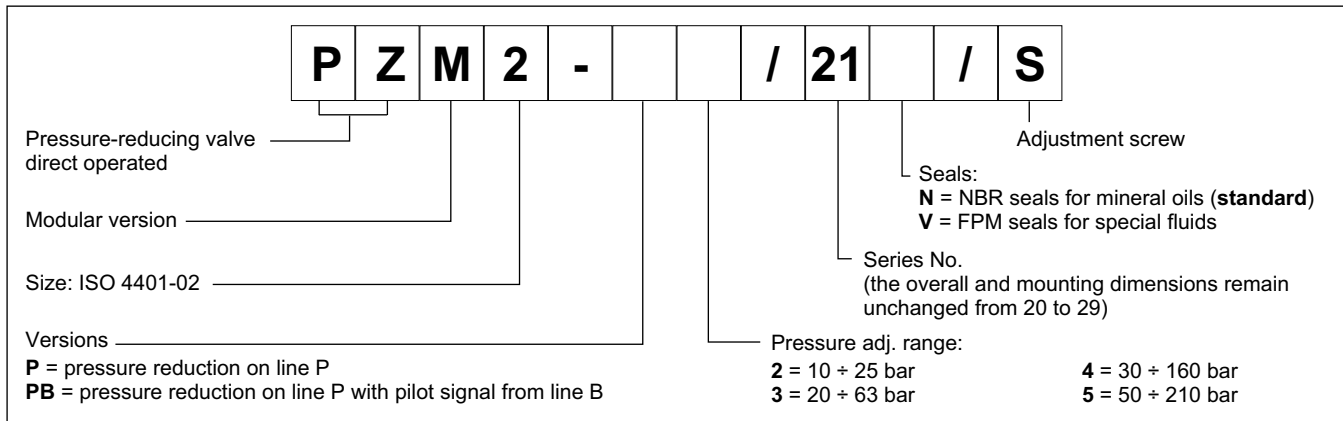
(measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	320
Maximum pressure on port T		210
Maximum flow rate in the controlled lines	l/min	20
Maximum flow rate in the free lines		30
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 + 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	0,6

HYDRAULIC SYMBOL



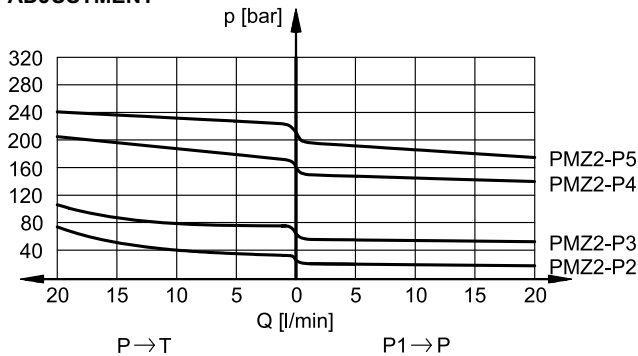
1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)

ADJUSTMENT



3 - HYDRAULIC FLUIDS

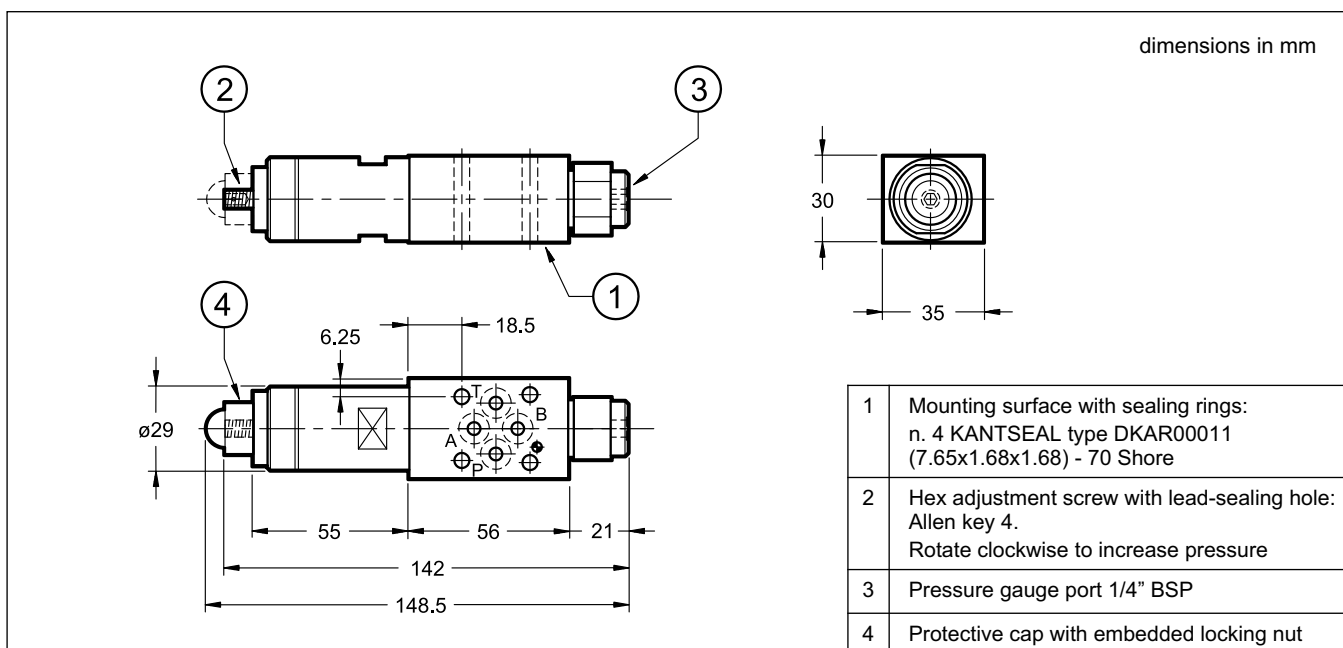
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N).

For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS



DZC*

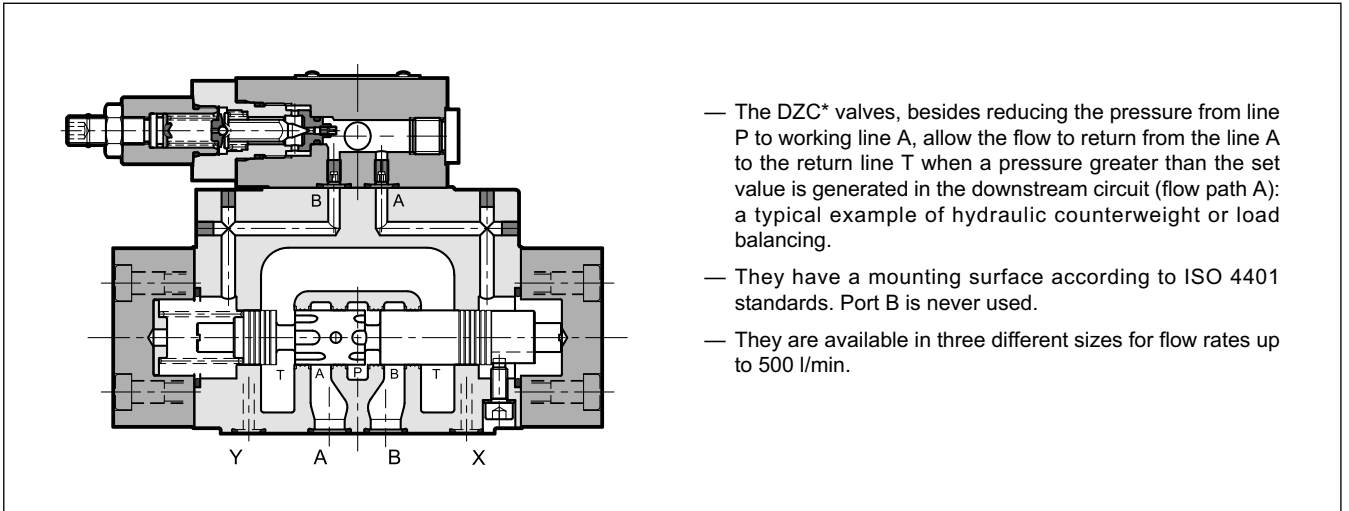
PRESSURE REDUCING VALVES SERIES 12



DZC5 **CETOP P05**
DZC5R **ISO 4401-05**
DZC7 **ISO 4401-07**
DZC8 **ISO 4401-08**

p max **350** bar
Q max (see table of performances)

OPERATING PRINCIPLE

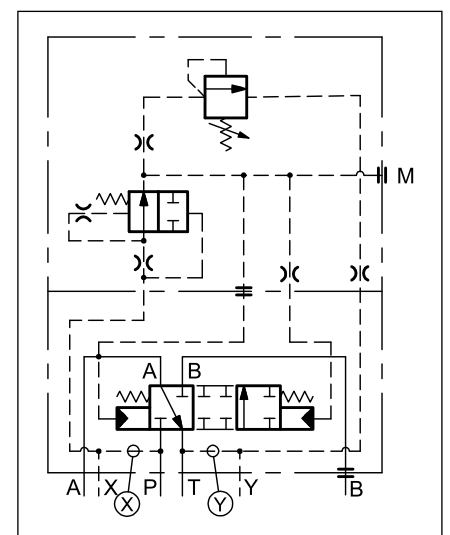


PERFORMANCES

(obtained with mineral oil with viscosity of 36 cSt at 50°C)

		DZC5 DZC5R	DZC7	DZC8
Maximum operating pressure	bar	350		
Maximum flow	l/min	150	300	500
Ambient temperature range	°C	-20 / +60		
Fluid temperature range	°C	-20 / +80		
Fluid viscosity range	cSt	10 ÷ 400		
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15			
Recommended viscosity	cSt	25		
Mass	kg	6,3	8,6	15

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE

D	Z	C	-	/ 12	-	/	
----------	----------	----------	----------	-------------	----------	----------	--

Pressure reducing valve

Nominal size:
5 = CETOP P05 (**NOTE**)
5R = ISO 4401-05
7 = ISO 4401-07
8 = ISO 4401-08

Pressure control range
070 = 5 + 70 bar
140 = 5 + 140 bar
210 = 5 + 210 bar

Series No. _____
 (the overall and mounting dimensions remain unchanged from 10 to 19)

K1 = Adjustment knob
 (omit for adjustment with socket hex screw)

Drainage: **I** = internal
E = external

Piloting: **I** = internal
E = external

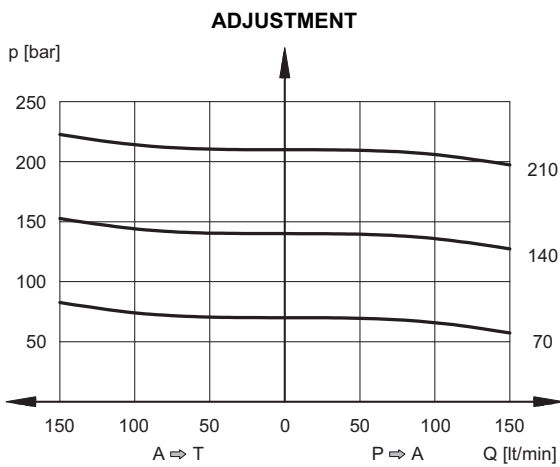
Seals:
N = NBR seals for mineral oil (**standard**)
V = FPM seals for special fluids

NOTE: This version is interchangeable with the previous model ZC4 Diplomatic

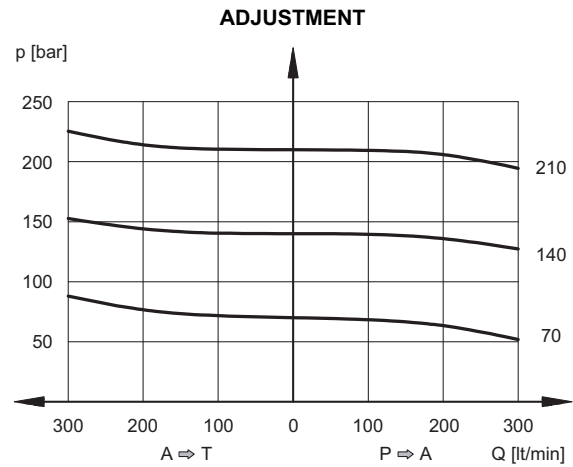
2 - CHARACTERISTIC CURVES

(obtained with mineral oil with viscosity of 36 cSt at 50°C)

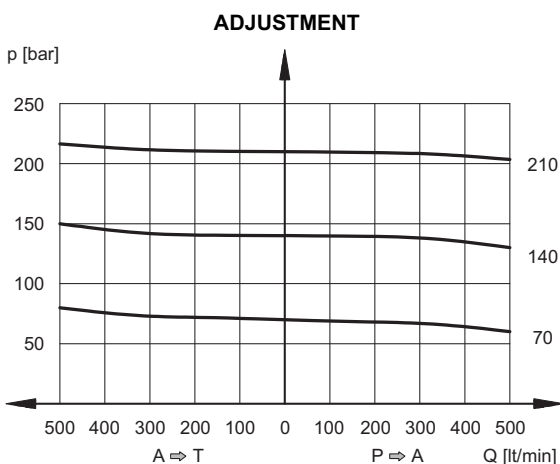
2.1 - Characteristic curves DZC5 and DZC5R



2.2 - Characteristic curves DZC7



2.3 - Characteristic curves DZC8



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - PILOTING AND DRAINAGE

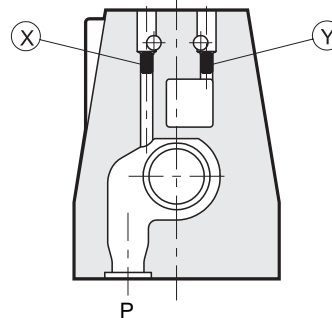
The valves are available with piloting and drainage, both internal and external. The version with external drainage allows a higher backpressure on the unloading.

TYPE OF VALVE	Plug assembly	
	X	Y
IE INTERNAL PILOT AND EXTERNAL DRAIN	NO	YES
II INTERNAL PILOT AND INTERNAL DRAIN	NO	NO
EE EXTERNAL PILOT AND EXTERNAL DRAIN	YES	YES
EI EXTERNAL PILOT AND INTERNAL DRAIN	YES	NO

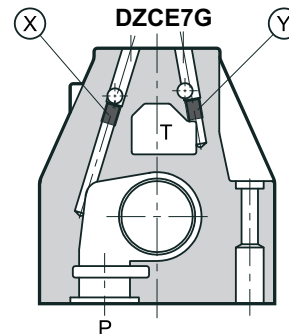
PRESSURES (bar)

Pressure	MIN	MAX
Pilot pressure on port X	30	210
Pressure on T port with internal drain	-	2
Pressure on T port with external drain	-	250

DZCE5 and DZCE5RG

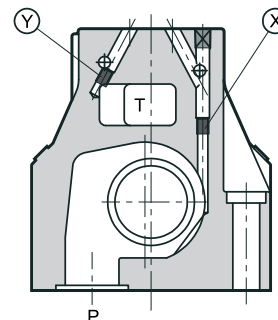


X: M5x6 plug for external pilot
Y: M5x6 plug for external drain



X: M6x8 plug for external pilot
Y: M6x8 plug for external drain

DZCE8G



X: M6x8 plug for external pilot
Y: M6x8 plug for external drain

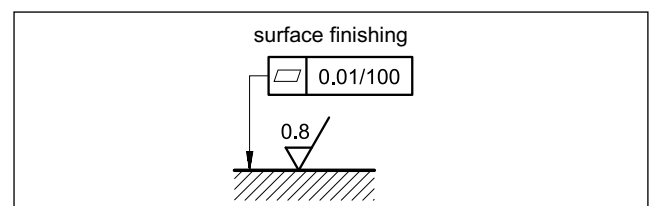
5 - INSTALLATION

The DZC* valves can be installed in any position without impairing correct operation.

Connect the valve T port directly to the tank. Add any backpressure value detected in the T line to the controlled pressure value.

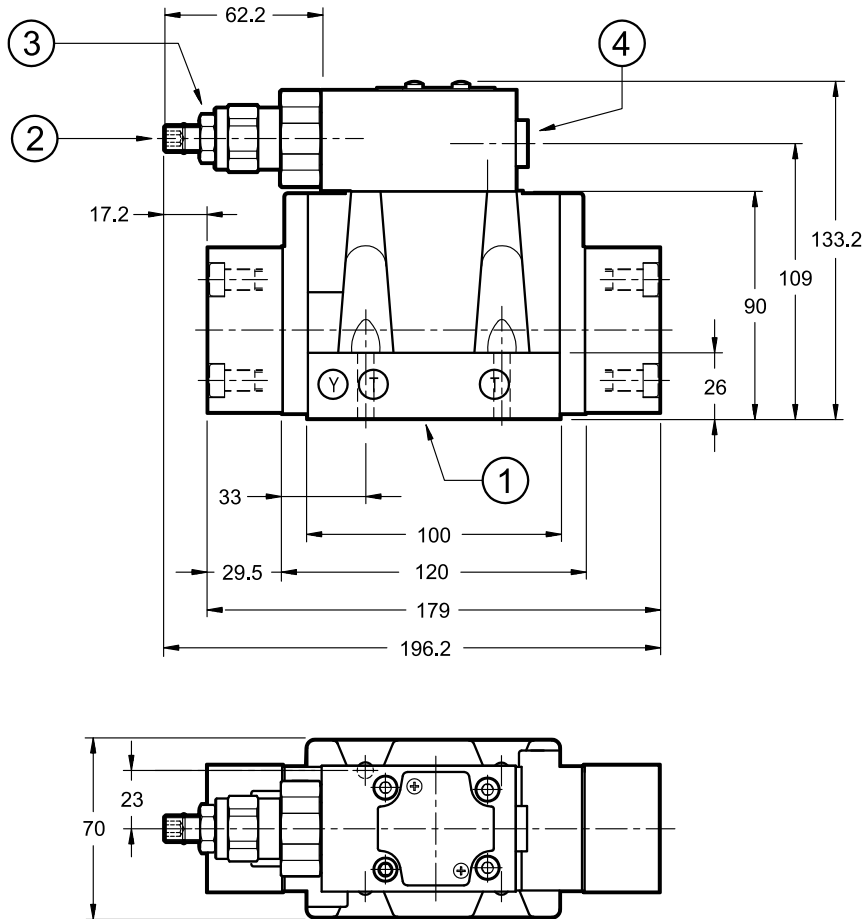
Maximum admissible backpressure in the T line, in operating conditions, is 2 bar.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.



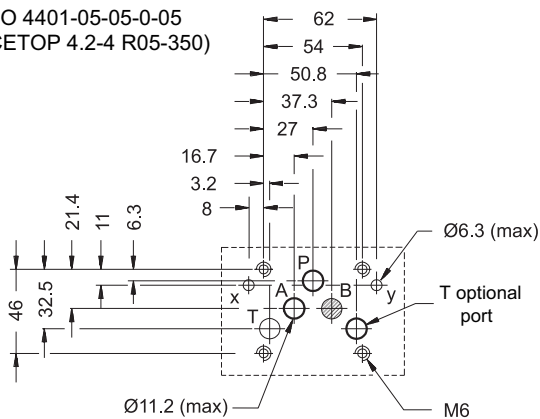
6 - DZC5 AND DZC5R OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



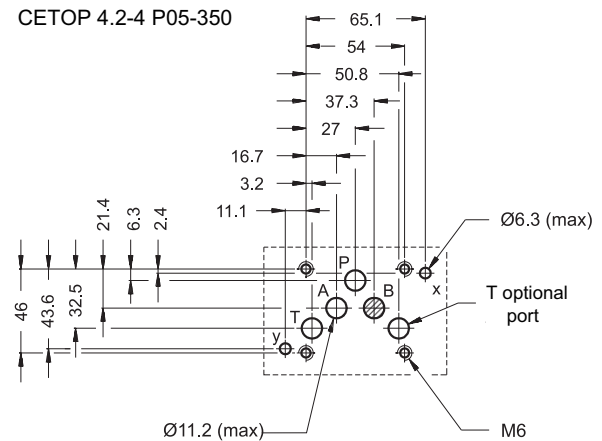
DZC5R MOUNTING SURFACE

ISO 4401-05-05-0-05
(CETOP 4.2-4 R05-350)



DZC5 MOUNTING SURFACE

CETOP 4.2-4 P05-350



Valve fastening: N. 4 bolts SHC ISO 4762 M6x35

Tightening torque: 8 Nm (A 8.8 bolts)

Thread of mounting holes: M6x10

1 Mounting surface with sealing rings:
N. 5 OR type 2050 (12.42x1.78) - 90 Shore
N. 2 OR type 2037 (9.25x1.78) - 90 Shore

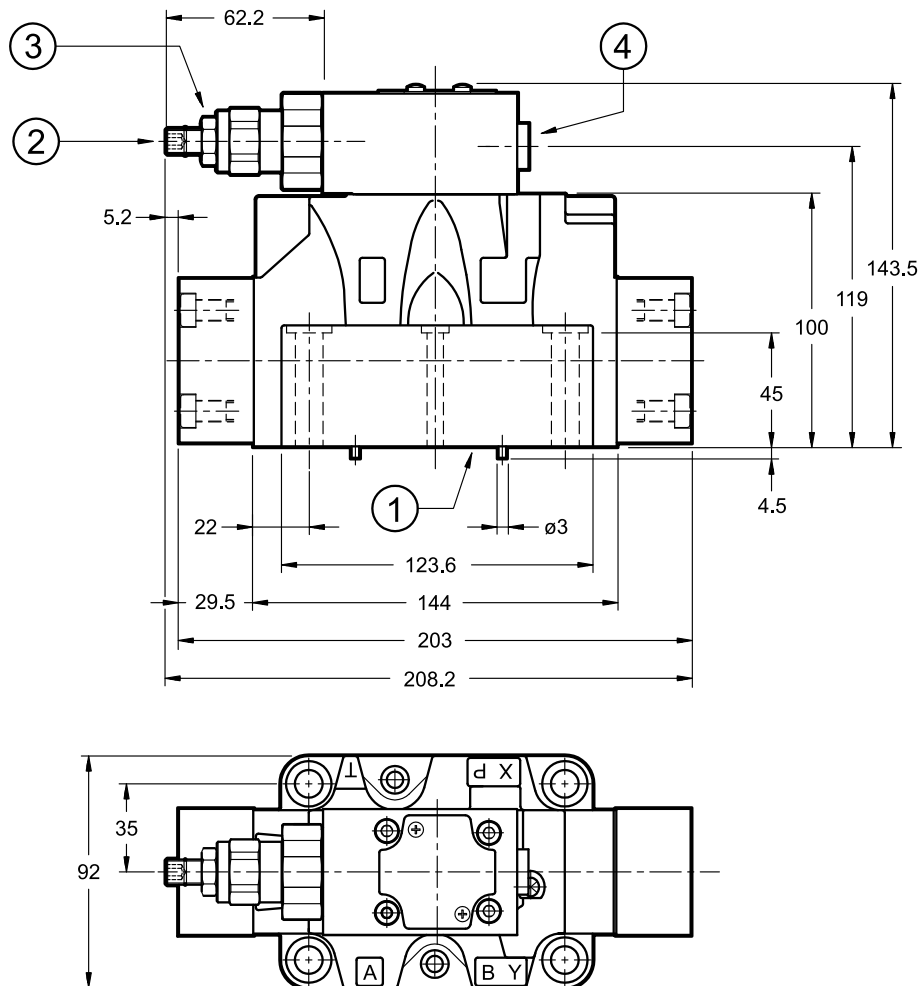
2 Socket hex adjustment screw: Allen key 5.
Clockwise rotation to increase pressure

3 Locking nut: spanner 17

4 Pressure gauge port 1/4" BSP

7 - DZC7 OVERALL AND MOUNTING DIMENSIONS

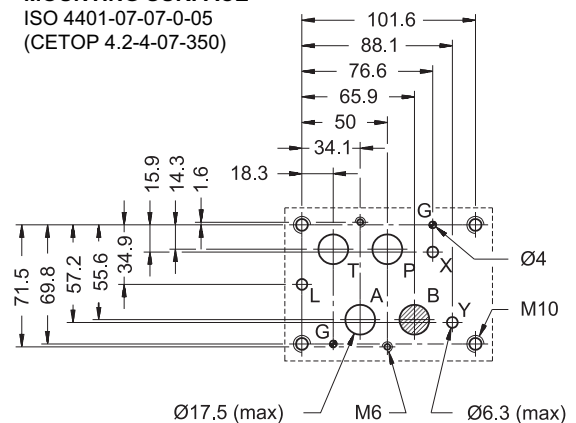
dimensions in mm



1	Mounting surface with sealing rings: N. 4 OR type 130 (22.22x2.62) - 90 Shore N. 2 OR type 2043 (10.82x1.78) - 90 Shore
2	Socket hex adjustment screw: Allen key 5. Clockwise rotation to increase pressure
3	Locking nut: spanner 17
4	Pressure gauge port 1/4" BSP

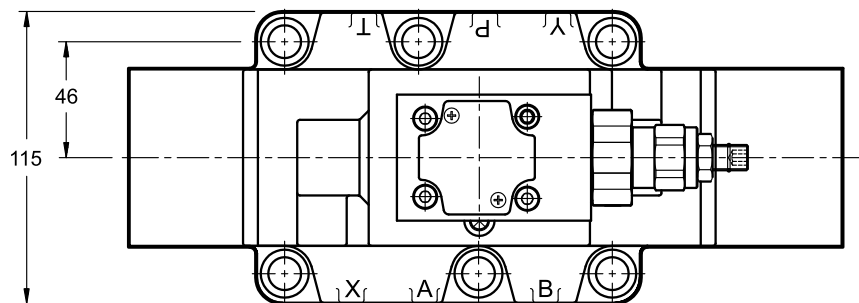
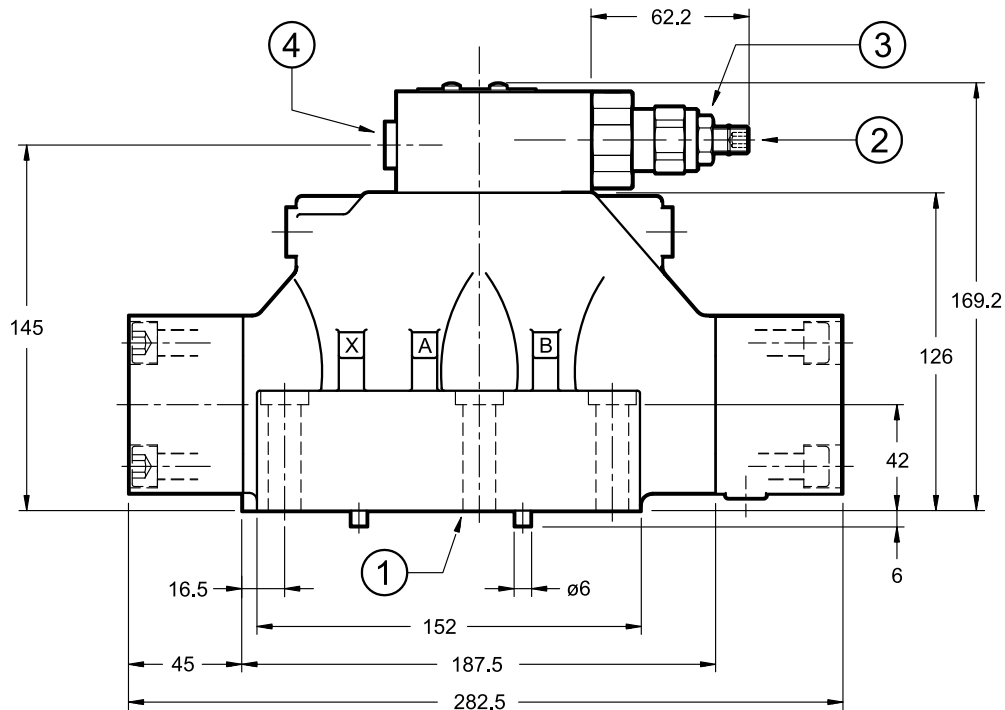
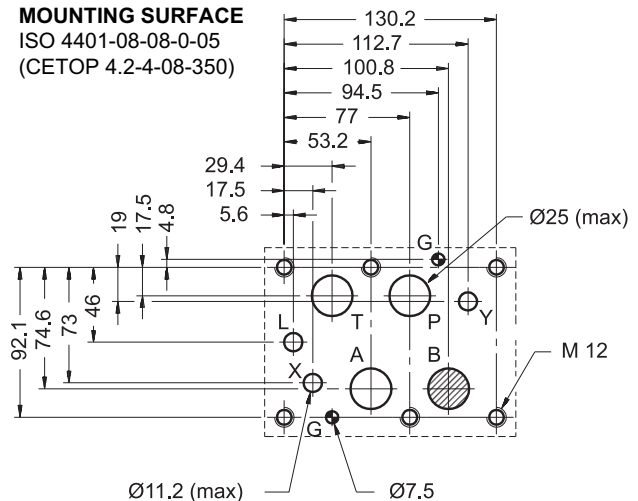
Single valve fastening:	N. 4 SHC bolts ISO 4762 M10x60 N. 2 SHC bolts ISO 4762 M6x60
Tightening torque M10x60:	40 Nm (A 8.8 bolts)
M6x60:	8 Nm (A 8.8 bolts)
Thread of mounting holes:	M6x18; M10x18

MOUNTING SURFACE

 ISO 4401-07-07-0-05
 (GETOP 4.2-4-07-350)


8 - DZC8 OVERALL AND MOUNTING DIMENSIONS

dimensions in mm


MOUNTING SURFACE
 ISO 4401-08-08-0-05
 (CETOP 4.2-4-08-350)


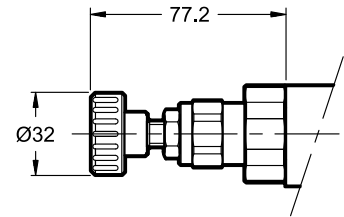
1	Mounting surface with sealing rings: N. 4 OR type 3118 (29.82x2.62) - 90 Shore N: 2 OR type 3081 (20.24x2.62) - 90 Shore
2	Socket hex adjustment screw: Allen key 5. Clockwise rotation to increase pressure
3	Locking nut: spanner 17
5	Pressure gauge port 1/4" BSP

Valve fastening: N. 6 SHC bolts ISO 4762 M12x60
Tightening torque: 69 Nm (A 8.8 bolts)
Thread of mounting holes: M12x20



9 - OPTIONS

The valves can be equipped with adjustment knob instead of the standard socket head screw.
Add **K1** at the identification code end (see par.1).



10 - SUBPLATES

(See catalogue 51 000)

	DZC5	DZC7	DZC8
Model with rear ports	PME4-AI5G	PME07-AI6G	-
Model with side ports	PME4-AL5G	PME07-AL6G	PME5-AL8G
Thread of ports: P - T - A - B X - Y	3/4" BSP 1/4" BSP	1" BSP 1/4" BSP	1 1/2" BSP 1/4" BSP



DZC*
SERIES 12



DIPLOMATIC MS S.p.A.

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tel. +39 0331.895.111 ▪ www.diplomatic.com ▪ e-mail: sales.exp@diplomatic.com



ZC2

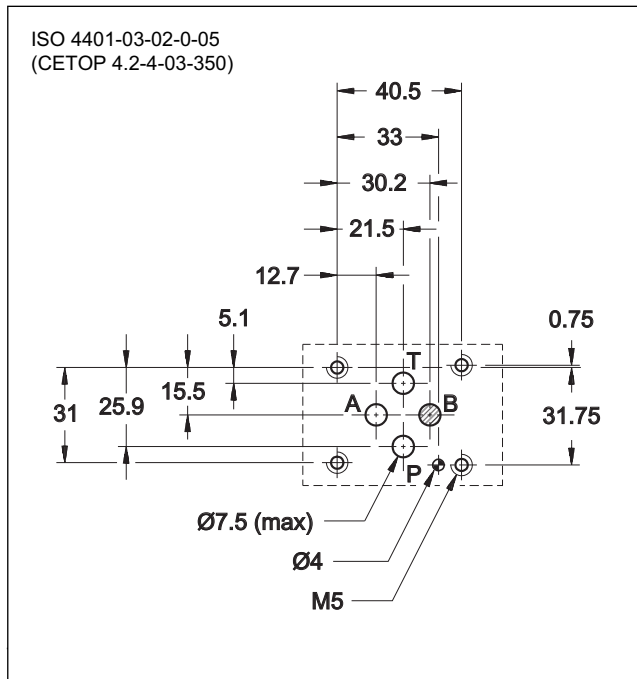
BALANCING VALVES

SERIES 51

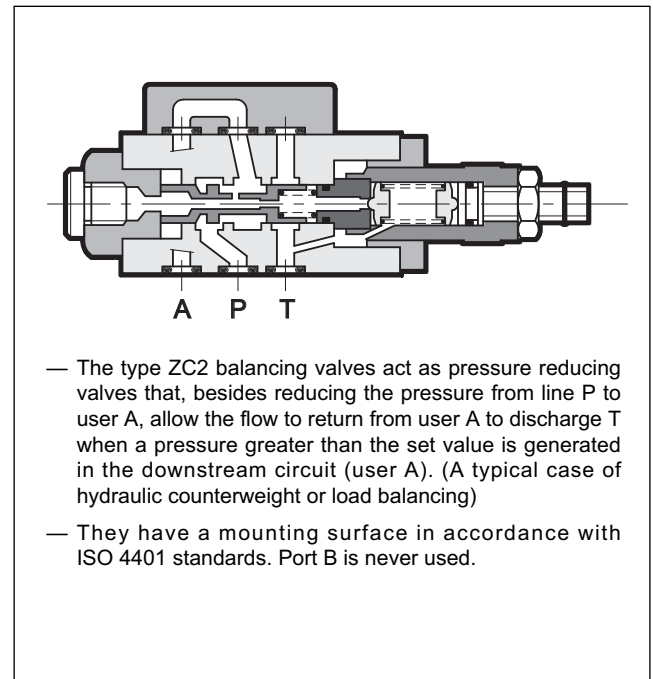
SUBPLATE MOUNTING ISO 4401-03

p max 350 bar
Q max 25 l/min

MOUNTING INTERFACES



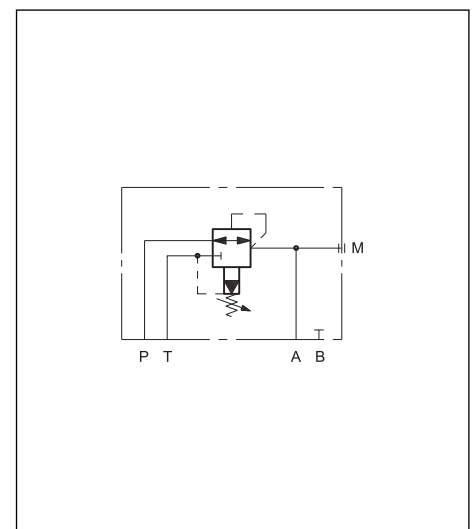
OPERATING PRINCIPLE



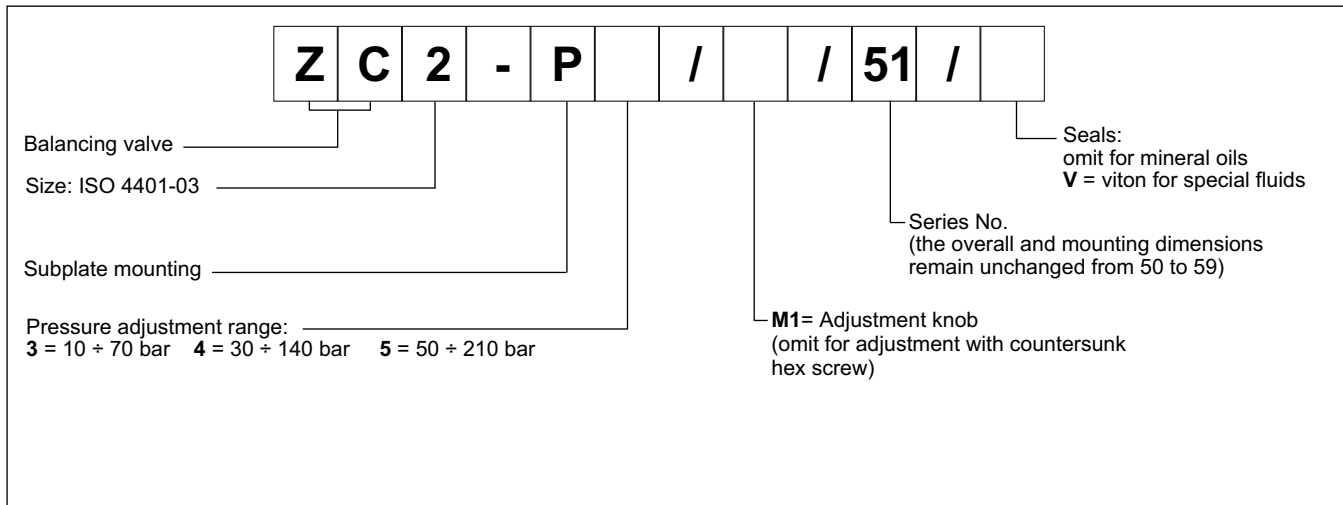
PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

Maximum operating pressure	bar	350
Maximum flow rate	l/min	25
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	1,3

HYDRAULIC SYMBOL

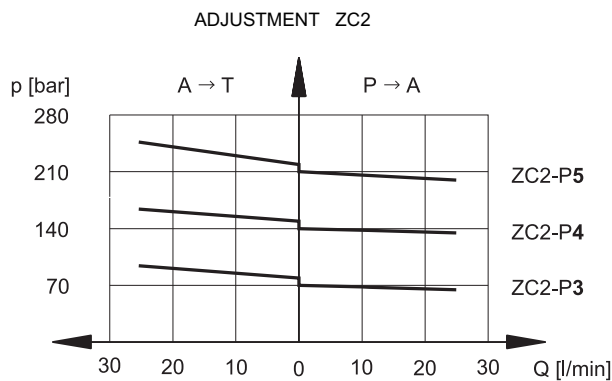


1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)

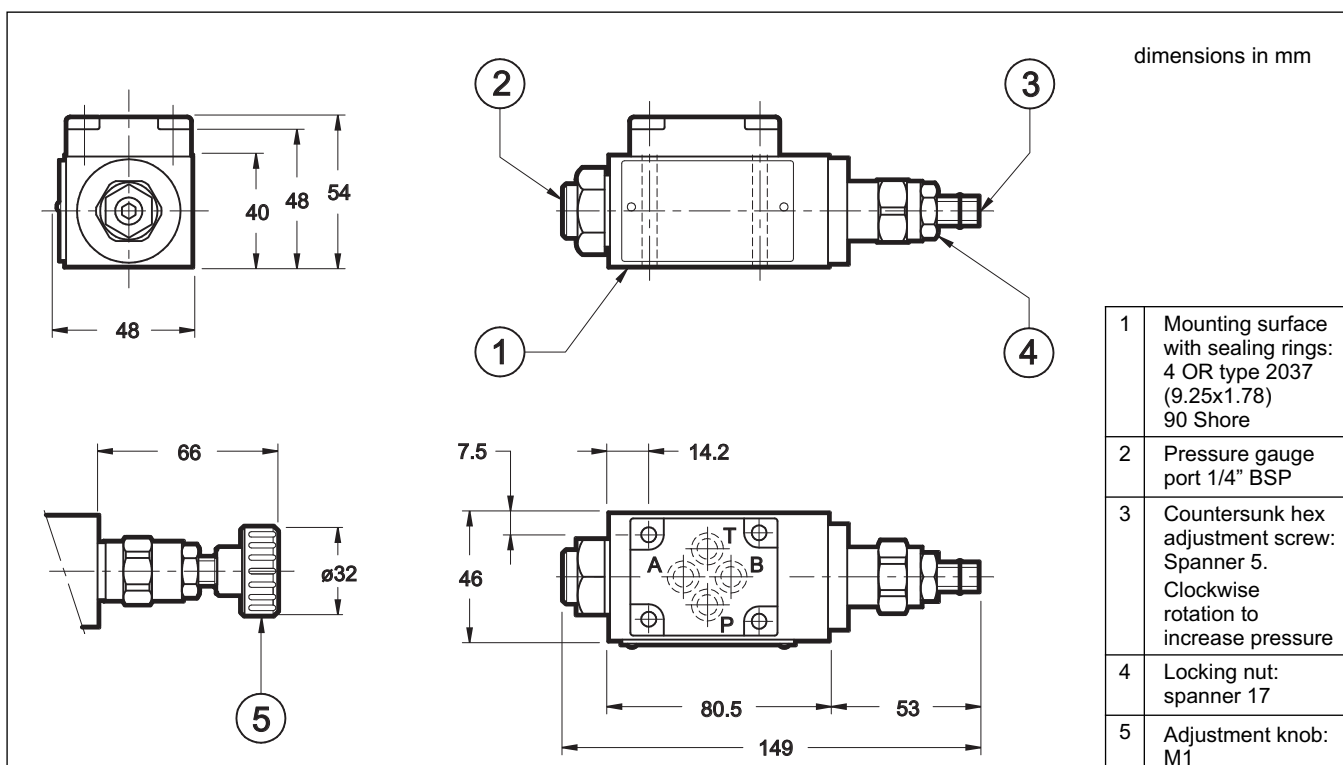


3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

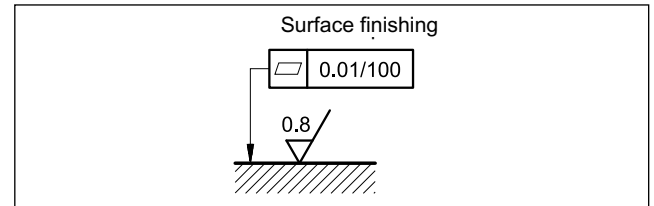
4 - ZC2 OVERALL AND MOUNTING DIMENSIONS



9 - INSTALLATION

The ZC2 valves can be installed in any position without impairing correct operation.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.



6 - FASTENING BOLTS

Fastening bolts are delivered with the valve.

N. 4 bolts M5x55
Tightening torque: 5 Nm (A 8.8 screws)

7 - SUBPLATES (see cat. 51 000)

Type PMMD-AL3G ports on rear 3/8" BSP
Type PMMD-AL3G side ports 3/8" BSP



ZC2
SERIES 51



DIPLOMATIC MS S.p.A.

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Z4M

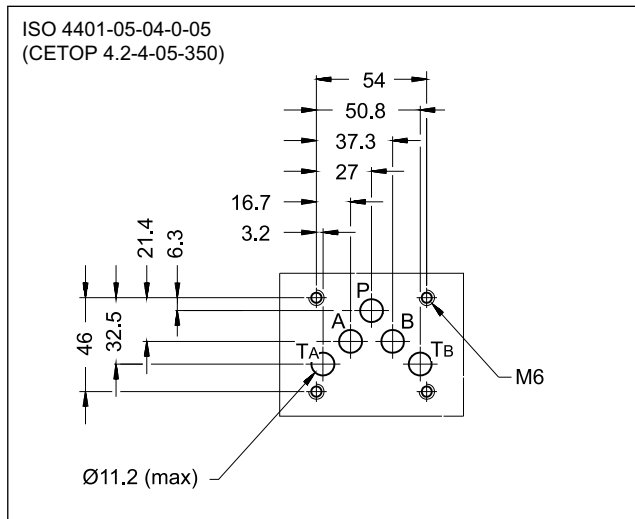
PILOT OPERATED PRESSURE REDUCING VALVE

SERIES 50

MODULAR VERSION ISO 4401-05

p max **350** bar
Q max (see table of performances)

MOUNTING INTERFACE



OPERATING PRINCIPLE

- The Z4M valve is a pilot operated pressure reducing valve shaped as modular version with mounting surface according to ISO 4401 standards.
- It reduces pressure on secondary circuit branches, assuring stability of the controlled pressure and even changing the flow that passes through the valve.
- It can be assembled quickly under ISO 4401-05 directional solenoid valves without the use of pipes.
- It is supplied with a hex socket adjustment screw, locking nut and a travel limiting device for maximum adjustment.
- It is available in four different pressure adjustment ranges, up to 320 bar.

CONFIGURATIONS

(see hydraulic symbols table)

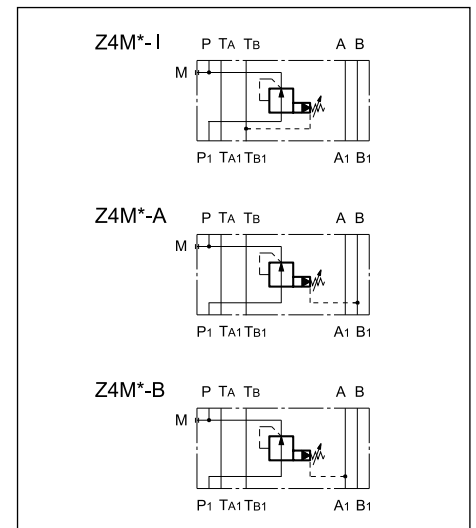
- Z4M*-I: pressure reduction on line P - drainage connected to line T_B.
- Z4M*-A: pressure reduction on line A and full pressure on line B.
- Z4M*-B: pressure reduction on line B and full pressure on line A.

PERFORMANCES

(measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure: Z4M*-I Z4M*-A, Z4M*-B	bar	350 210
Maximum flow rate in the controlled line P	l/min	80
Maximum flow rate in the free lines		100
Drain flow rate		< 0,7
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Recommended effective viscosity	cSt	25
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Mass	kg	2,7

HYDRAULIC SYMBOLS



1 - IDENTIFICATION CODE

	Z	4	M	-	/	/	50	/	
--	----------	----------	----------	----------	----------	----------	-----------	----------	--

Pressure reducing valve ————

Size: ISO 4401-05 ————

Modular version ————

Pressure adjustment range: ————

3 = 5 ÷ 70 bar
4 = 8 ÷ 140 bar
5 = 10 ÷ 210 bar
6 = 15 ÷ 320 bar (available only for I version)

Seals: omit for mineral oils
V = viton for special fluids

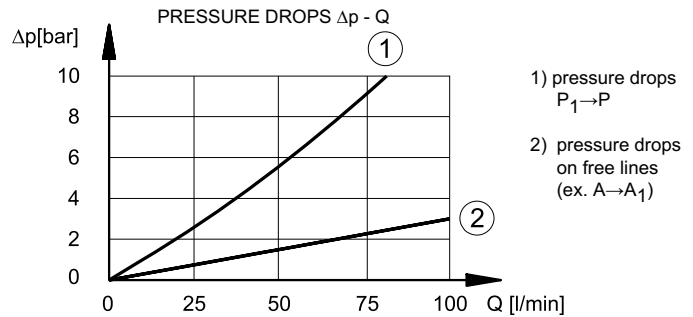
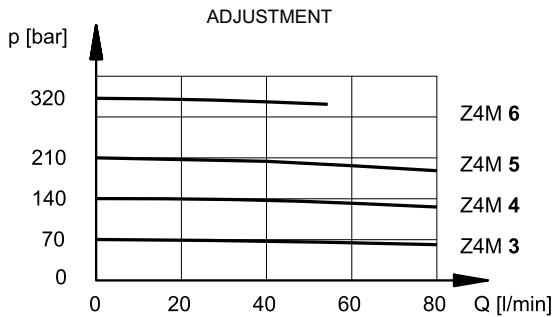
Series No. (the overall and mounting dimensions remain unchanged from 50 to 59)

M1 = Adjustment knob.
Omit for adjustment by socket hex screw.

Versions: **I**: pressure reduction on line P. Internal drain connected to line T_B
A: pressure reduction on line A and full pressure on line B
B: pressure reduction on line B and full pressure on line A

2 - CHARACTERISTIC CURVES

(values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

1	Locking nut spanner 17
2	Socket hex adjustment screw: Allen key 5. Rotate clockwise to increase pressure
3	Mounting surface with sealing rings: 5 OR type 2050 (12.42x1.78) 90 Shore
4	Pressure gauge port 1/4" BSP
5	Adjustment knob M1



Z*-P

PRESSURE REDUCING VALVES

SERIES 22

SUBPLATE MOUNTING

Z3-P ISO 5781-06

Z5-P ISO 5781-08

OPERATING PRINCIPLE

- The Z*-P type valves are used when a branch with a lower pressure than the main one is desired in the hydraulic circuits.

Being normally open, they allow passage of oil up to the point when the outlet pressure is less than that set on the valve; the valve closes and keeps the outlet pressure constant when it reaches the set value. The intake pressure fluctuation, for values greater than the set values, does not affect the reduced outlet pressure, and furthermore the particular design of the valve prevents exceeding the set value even in transients.

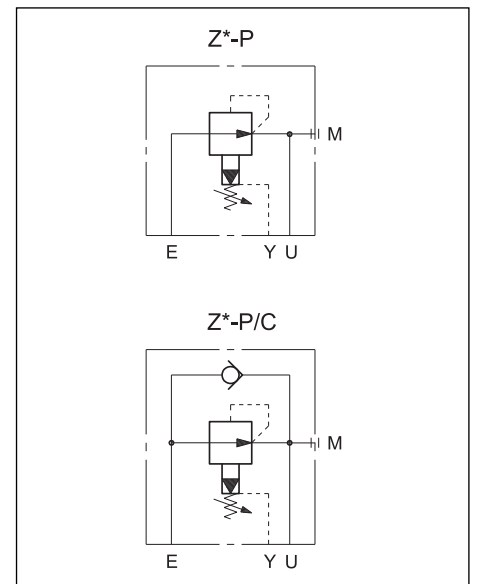
The drainage, to be connected directly to the tank, discharges about 0,8 l/min. The valves are available, upon request, with reduced drainage (0,4 l/min).

- Available even with incorporated check valve upon request, with cracking pressure of 0,5 bar.

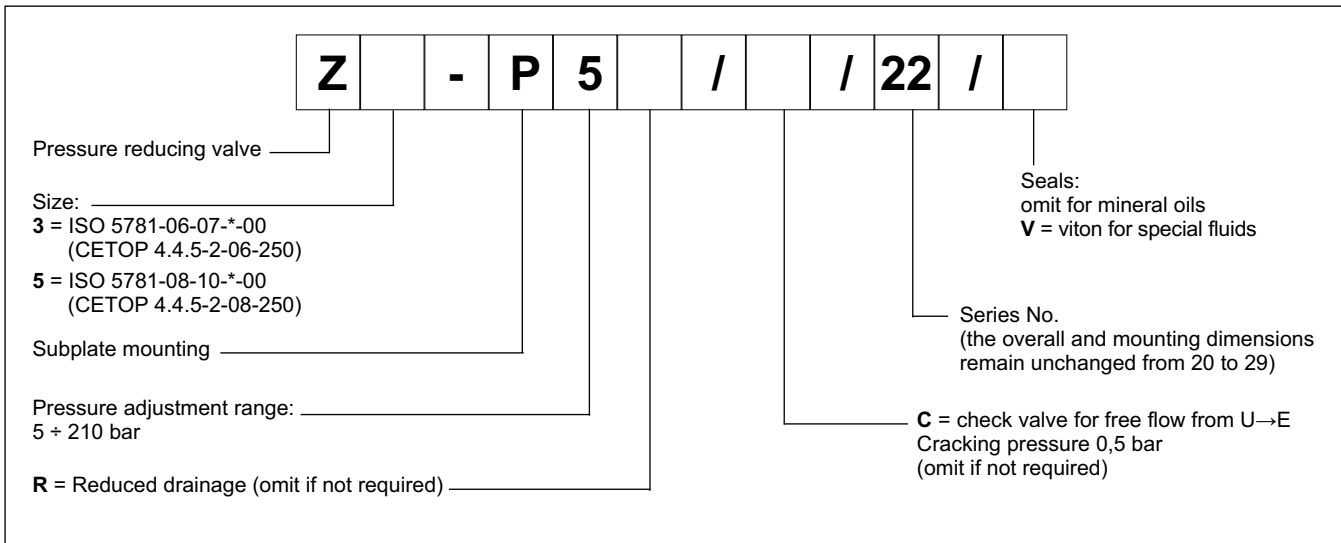
PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		Z3-P	Z5-P
Maximum operating pressure	bar	250	
Maximum flow rate	l/min	40	110
Drain flow rate: for Z*-P for Z*-P*R	l/min	0,8 0,4	
Ambient temperature range	°C	-20 / +60	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 + 400	
Fluid contamination degree	According to ISO 4406:1999 classe 20/18/15		
Recommended viscosity	cSt	25	
Mass	kg	3,9	6,1

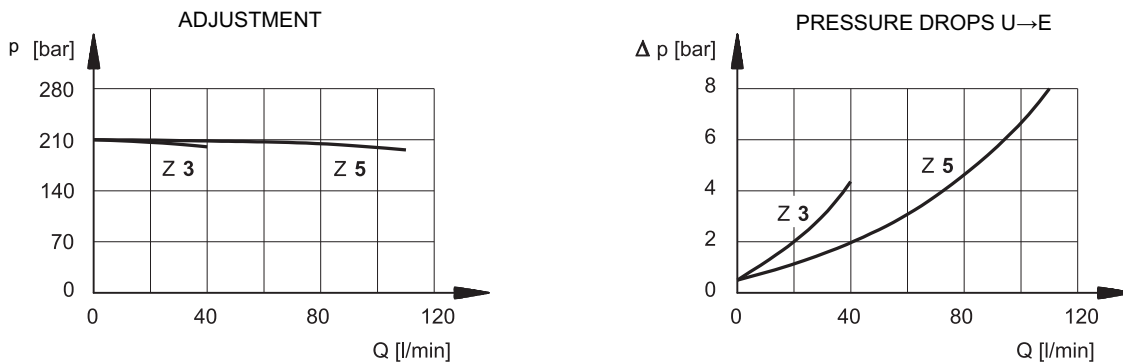
HYDRAULIC SYMBOLS



1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V).

For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

4 - Z3-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

MOUNTING SURFACE:
ISO 5781-06-07-*00 (CETOP 4.4.5-2-06-250)

NOTE: the position of the Y port corresponds to the position of the X port provided by the ISO Standard

1	SICBLOC adjustment knob. To operate, push and rotate at the same time.
2	Intake
3	Outlet port
4	Drainage port
5	Pressure gauge port 1/4" NPT
6	Supplementary tube port for drainage 1/4" BSP
7	Mounting surface with sealing rings: N. 2 OR type 3068 (17.13x2.62) N. 2 OR type 2021 (5.28x1.78) 90 Shore

FASTENING BOLTS:
4 bolts M10x70
Tightening torque: 40 Nm

5 - Z5-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

MOUNTING SURFACE:
ISO 5781-08-10-*00 (CETOP 4.4.5-2-08-250)

NOTE: the position of the Y port corresponds to the position of the X port provided by the ISO Standard

1	SICBLOC adjustment knob. To operate, push and rotate at the same time.
2	Intake
3	Outlet port
4	Drainage port
5	Pressure gauge port 1/4" NPT
6	Supplementary plug for drainage 1/4" BSP
7	Mounting surface with sealing rings: N. 2 OR type 3100 (25.07x2.62) 90 Shore N. 2 OR type 2021 (5.28x1.78) 90 Shore

FASTENING BOLTS:
4 bolts M10x70
Tightening torque: 40 Nm



6 - SUBPLATES (see catalogue 51 000)

	Z3-P	Z5-P
Type	PMSZ3-Al4G with rear ports	PMSZ5-Al6G with rear ports
Port dimensions: - E, U - X, Y	1/2" BSP 1/4" BSP	1" BSP 1/4" BSP



MSD

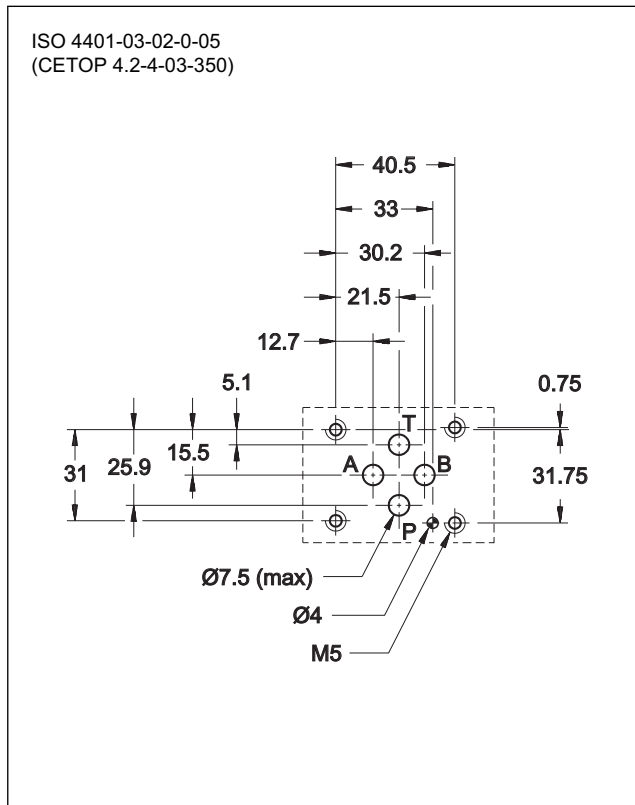
DIRECT OPERATED SEQUENCE VALVE

SERIES 50

MODULAR VERSION ISO 4401-03

p max 350 bar
Q max (see table of performances)

MOUNTING INTERFACE



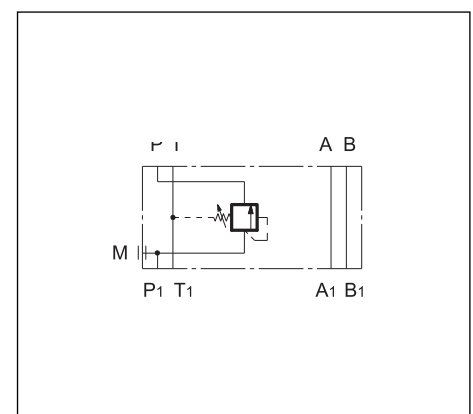
OPERATING PRINCIPLE

- The MSD valve is a direct operated sequence valve of the spool type and is used to control two or more actuators in succession.
- At rest position, it is normally closed and the spool is subject to pressure in line P1 on one side and to the adjustment screw on the other side. When the pressure in line P1 reaches the set value of the screw, the valve opens and allows passage of the fluid in the pressure line of the main circuit.
- The valve stays open until the pressure in the circuit drops below the calibrated value set by the spring.
- It is made as a modular version with ports according to the ISO 4401 standards and can be assembled quickly without the use of pipes under the ISO 4401-03 directional solenoid valves.
- It is normally supplied with a hexagonal head adjustment screw. Upon request, it can be equipped with a SICBLOC adjustment knob with micrometric indication and automatic locking.

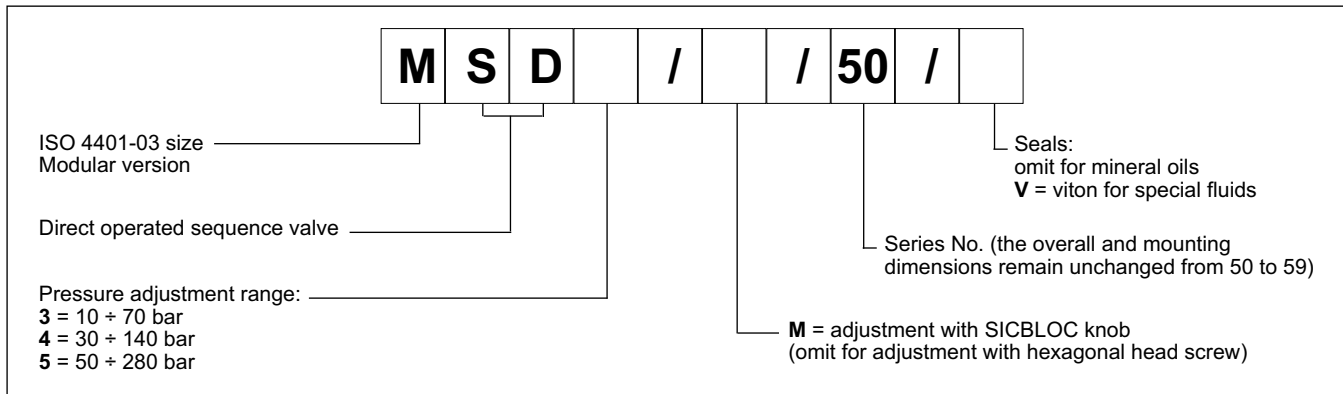
PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure maximum pressure on port T	bar	350 10
Maximum flow rate in the controlled lines Maximum flow rate in the free lines	l/min	50 75
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	1,4

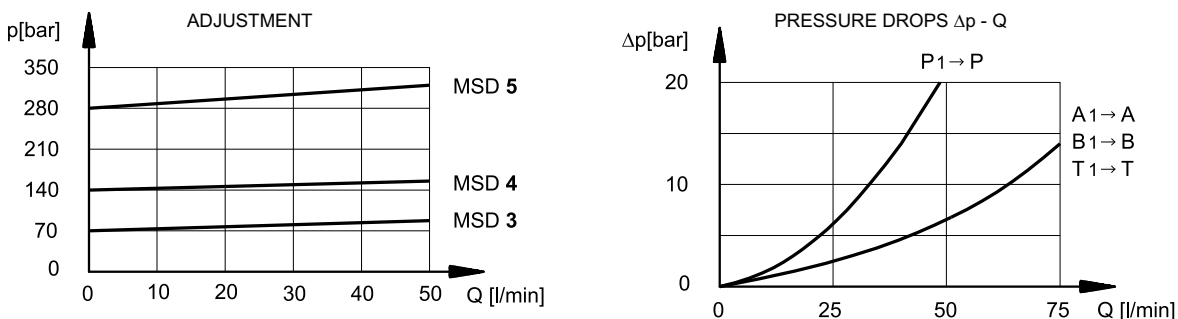
HYDRAULIC SYMBOLS



1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

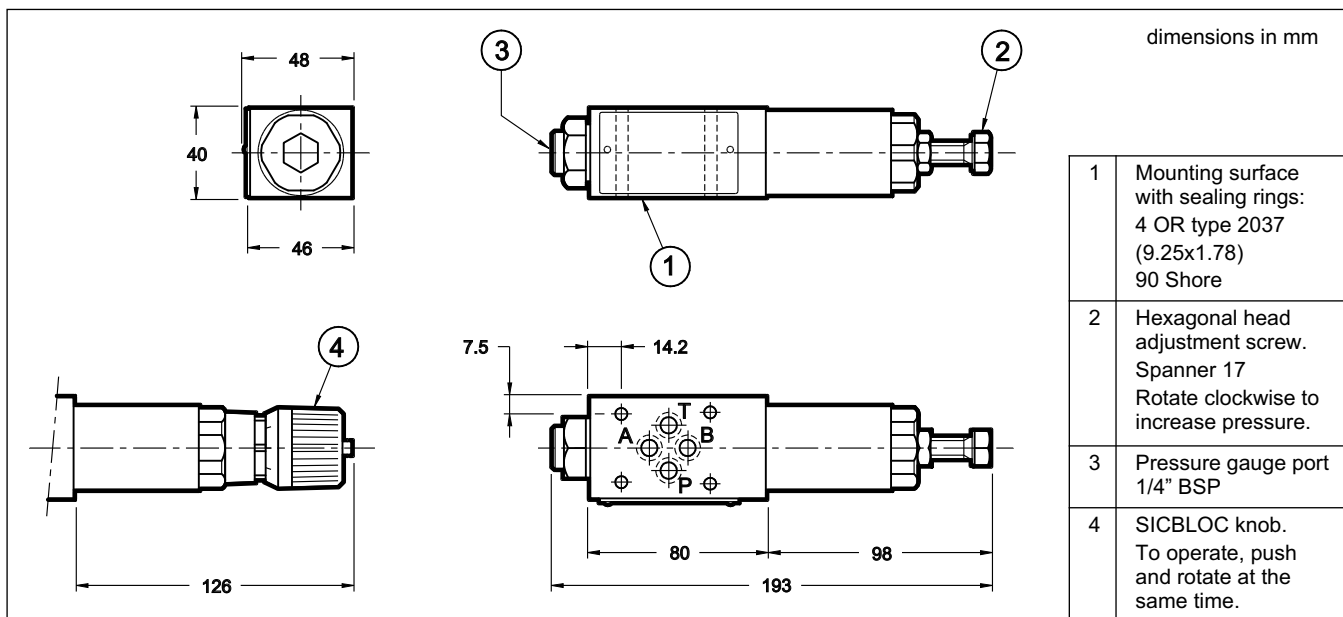


3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - OVERALL AND MOUNTING DIMENSIONS





S*-P
SEQUENCE VALVE

U*-P
UNLOADING VALVE

T*-P
BACKPRESSURE VALVE

X*-P
BALANCING VALVE

SERIES 20

OPERATING PRINCIPLE

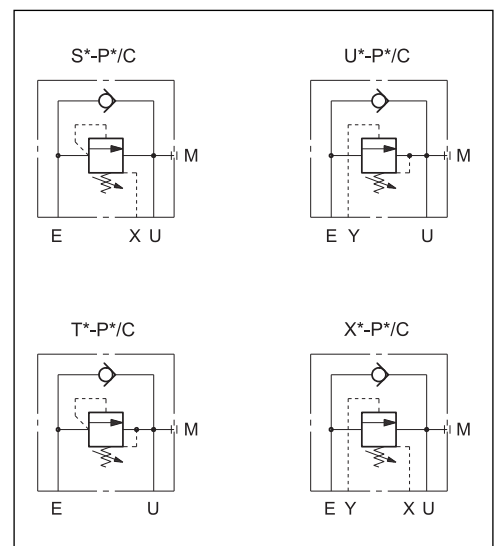
- The S U T X sequence valves are used for pressure control. They are direct-acting and normally closed.
- They are available in two nominal sizes for flows up to 150 l/min and in four pressure adjustment ranges.
- Opening takes place by means of a pilot pressure that, acting on a small piston, resists the force of the adjustment spring.
- The valve can be easily modified to get any one of the four versions **S**, **U**, **T**, **X**, turning the upper and the bottom covers in order to obtain the X and Y internal connections, as indicated in par. 7.

The figure represents the section of a type S valve.

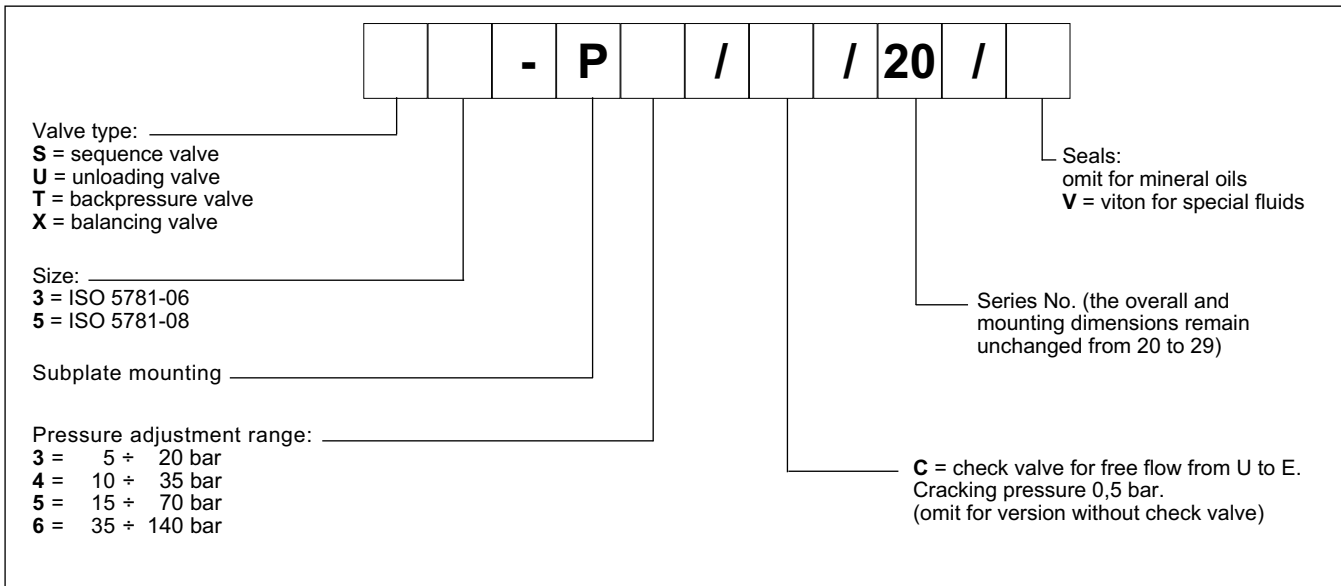
PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		size 3	size 5
Maximum operating pressure	bar	320	250
Maximum flow rate	l/min	60	150
Ambient temperature range	°C	-20 / +60	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 + 400	
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15		
Recommended viscosity	cSt	25	
Mass	kg	5,8	6,7

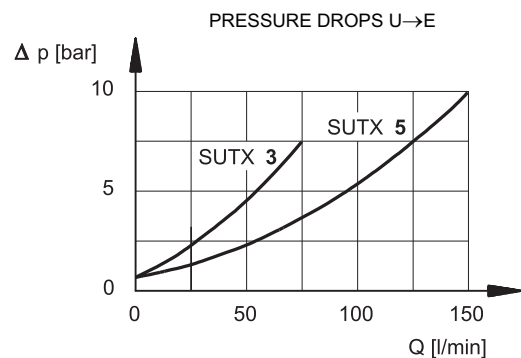
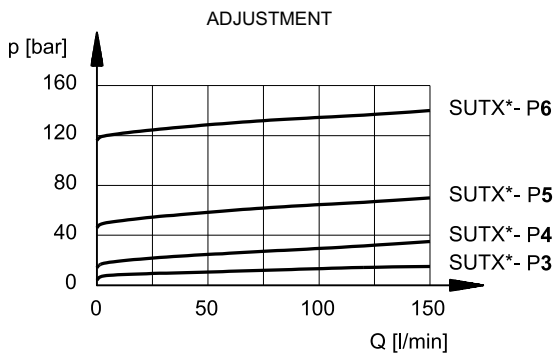
HYDRAULIC SYMBOLS



1 - IDENTIFICATION CODE



2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



3 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

4 - SUTX 3-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

FASTENING BOLTS:
4 bolts M10x70
Tightening torque: 40 Nm

MOUNTING SURFACE:
ISO 5781-06-07-00 (CETOP 4.4.4-2-06-320)

NOTE: the positions of the X and Y ports are reversed from the requirements of the ISO Standard

1	Hexagonal head adjustment screw. Spanner 13.
2	Intake port
3	Outlet port
4	External drainage port
5	External piloting port
6	Pressure gauge port 1/4" NPT
7	Mounting surface with sealing rings: N. 2 OR type 3068 (17.13x2.62) - 90 Shore N. 2 OR type 2021 (5.28x1.78) - 90 Shore

5 - SUTX 5-P OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

FASTENING BOLTS:
4 bolts M10x70
Tightening torque: 40 Nm

MOUNTING SURFACE:
ISO 5781-08-10-00 (CETOP 4.4.5-2-08-320)

NOTE: the positions of the X and Y ports are reversed from the requirements of the ISO Standard

1	Hexagonal head adjustment screw. Spanner 13.
2	Intake port
3	Outlet port
4	External drainage port
5	External piloting port
6	Pressure gauge port 1/4" NPT
7	Mounting surface with sealing rings: N. 2 OR type 3100 (25.07x2.62) - 90 Shore N. 2 OR type 2021 (5.28x1.78) - 90 Shore

6 - APPLICATIONS

“S” The type “S” sequence valve is normally used to successively command two or more actuators: when the pressure in the primary circuit reaches the set value on the valve, it opens and allows the fluid to feed the second circuit branch, keeping the pressure in the first branch.

The valve remains open until the pressure at the intake falls below the set value; under these conditions, the maximum pressure setting on the first circuit branch will be achieved also at the outlet.

It is also used to keep a circuit under pressure when simultaneous supply of various users, requiring the total delivery of the pump, would make the pressure value decrease.

“U” This is normally used in automatic circuits (high-low pressure) for unloading the low pressure pump; this occurs when the pressure in the circuit reaches the set value of the valve.

In this manner it is possible to utilize the total flow of the two pumps for fast movements at low pressure, with electric power saving, using high pressure only for working movements.

Furthermore, it is used to allow quick discharge of the large

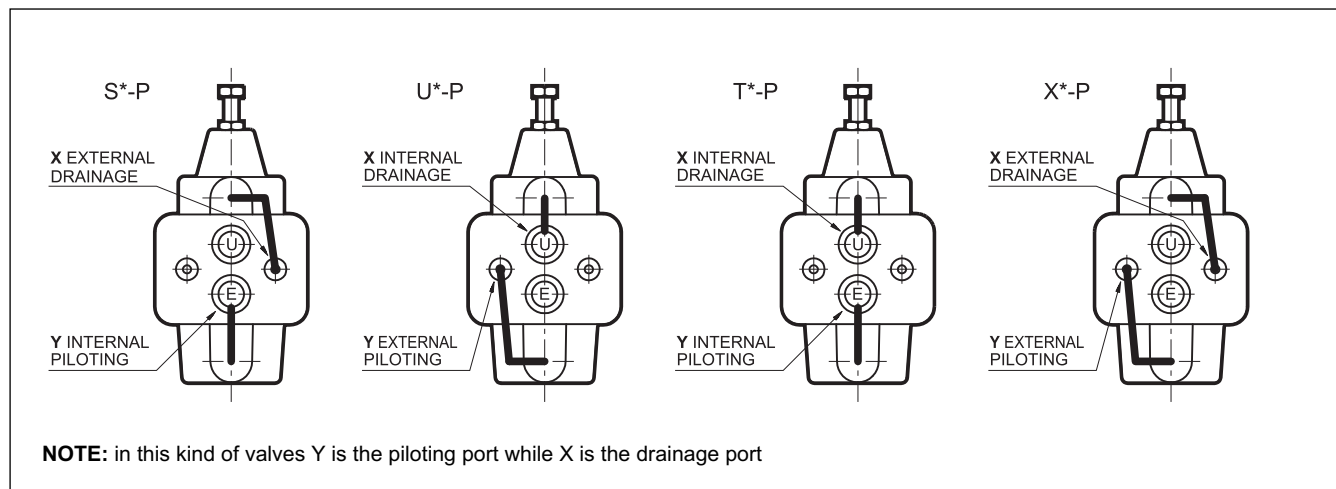
chamber of a high differential cylinder which the directional valve would not be able to drain; in this case the valve piloting is connected to the small chamber of the cylinder.

“T” Normally this is used to create hydraulic resistance (back pressure) to prevent uncontrolled movements, especially in the case of suspended loads.

The valve, normally closed, opens only when the set pressure is reached, and thus the descent of the load occurs in a controlled manner and the descending speed depends on the delivery of the pump.

“X” This is mainly used for load balancing. The piloting pressure can be taken from any point in the plant. The valve stays closed until the pilot pressure reaches the set value.

7 - COVER ORIENTATION FOR ALL THE VERSIONS S, U, T, X



7 - SUBPLATES (see catalogue 51 000)

	SIZE 3	SIZE 5
Type with rear ports	PMSZ3-AI4G	PMSZ5-AI5G
Ports dimensions:	E, U X, Y	1" BSP 1/4" BSP

DIPLOMATIC MS S.p.A.
 via M. Re Depaolini 24 • 20015 PARABIAGO (MI) • ITALY
 tel. +39 0331.895.111 • www.diplomatic.com • e-mail: sales.exp@diplomatic.com



SD4M

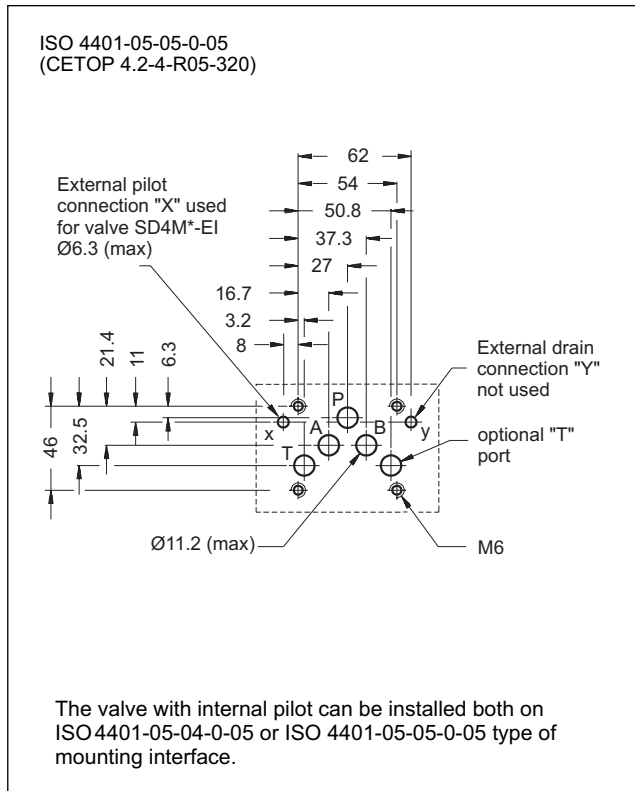
DIRECT OPERATED SEQUENCE VALVE

SERIES 50

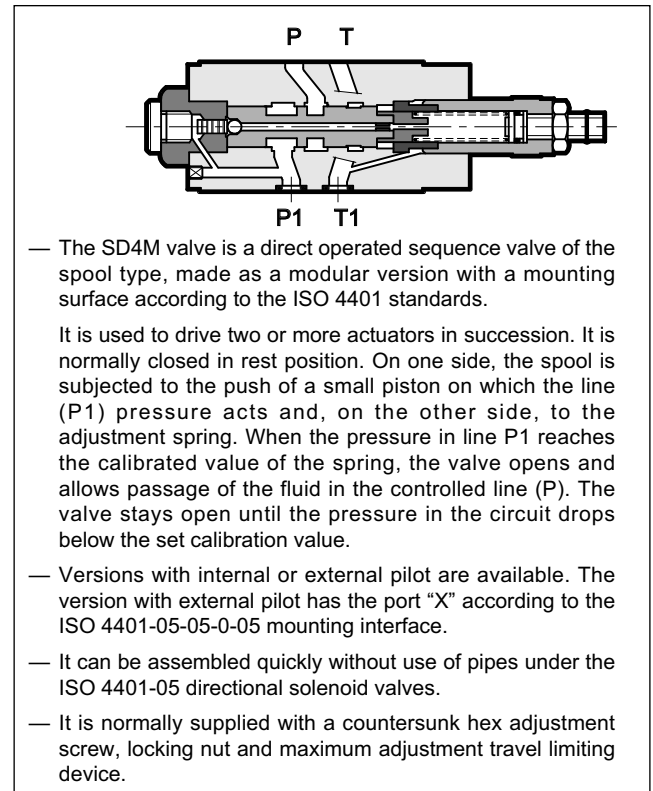
MODULAR VERSION ISO 4401-05

p max 320 bar
Q max (see table of performances)

MOUNTING INTERFACE



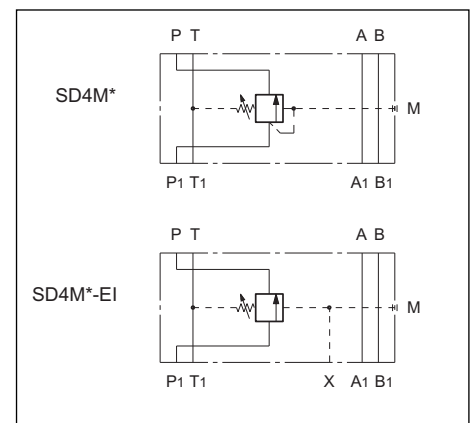
OPERATING PRINCIPLE



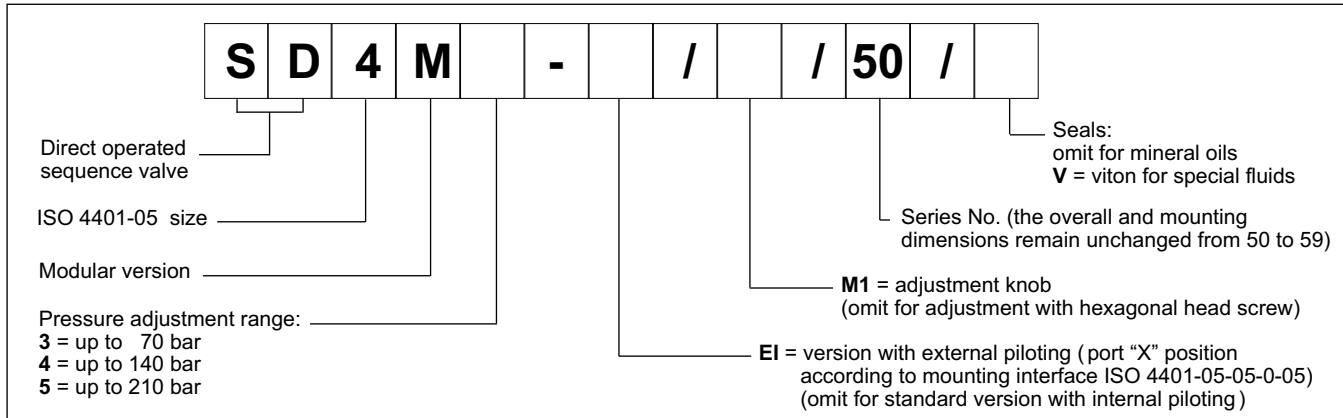
PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

Maximum operating pressure maximum pressure on port T	bar	320 10
Maximum flow rate in the controlled lines Maximum flow rate in the free lines	l/min	80 100
Ambient temperature range	°C	-20 / +60
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	2,7

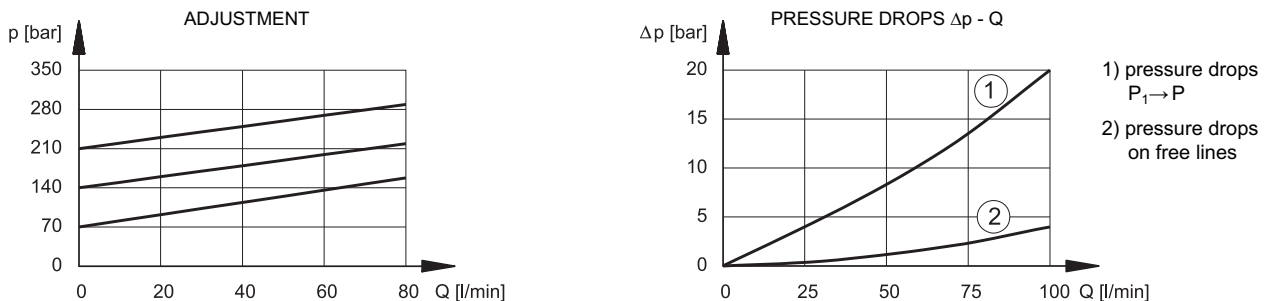
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4 - OVERALL AND MOUNTING DIMENSIONS

