

# CR

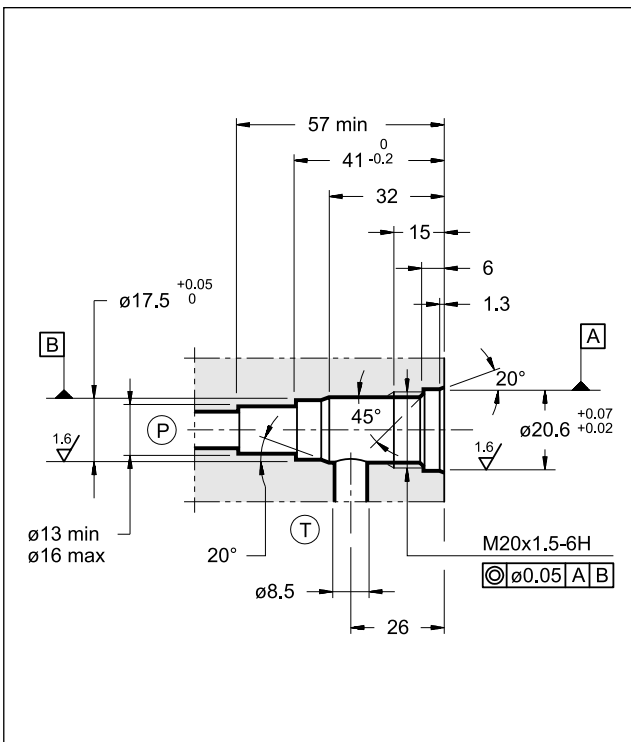
## DIRECT OPERATED PRESSURE CONTROL VALVE SERIES 22



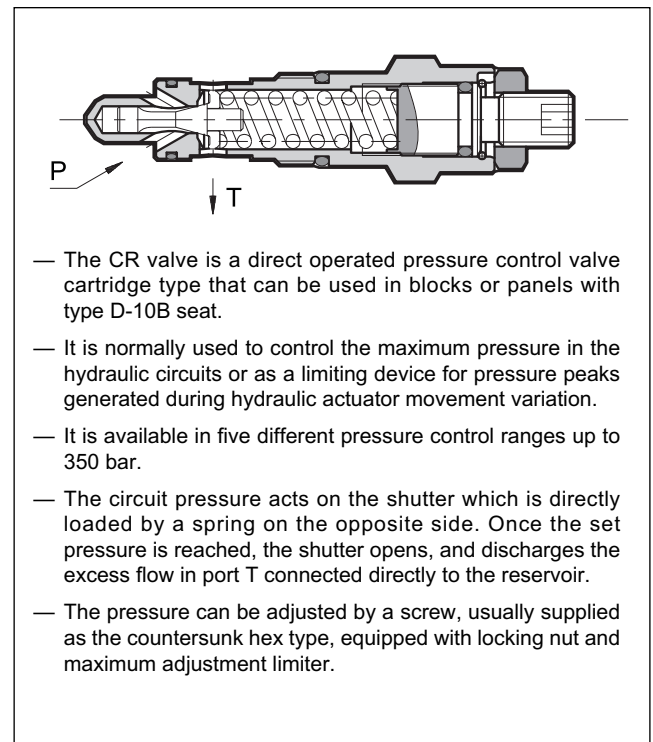
### CARTRIDGE TYPE

**p** max 350 bar  
**Q** max 50 l/min

### SEAT DIMENSIONS: D-10E



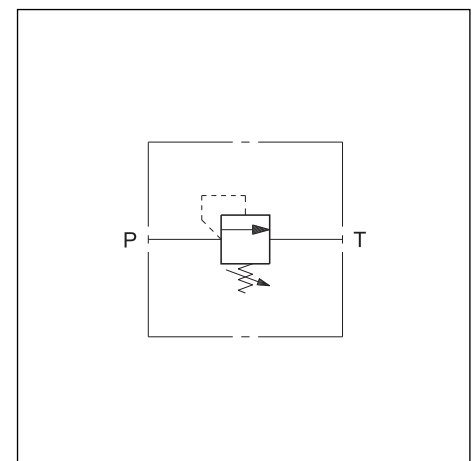
### OPERATING PRINCIPLE



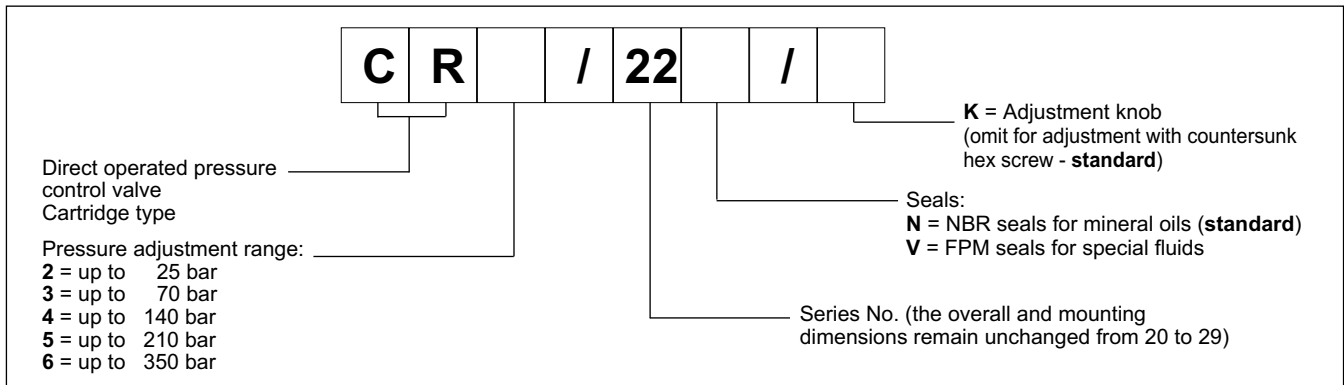
### PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

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	

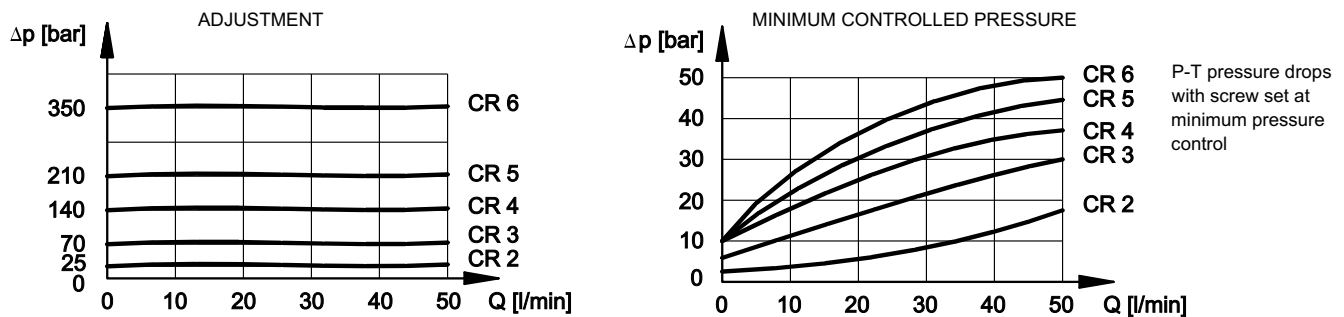
### HYDRAULIC SYMBOL



### 1 - IDENTIFICATION CODE



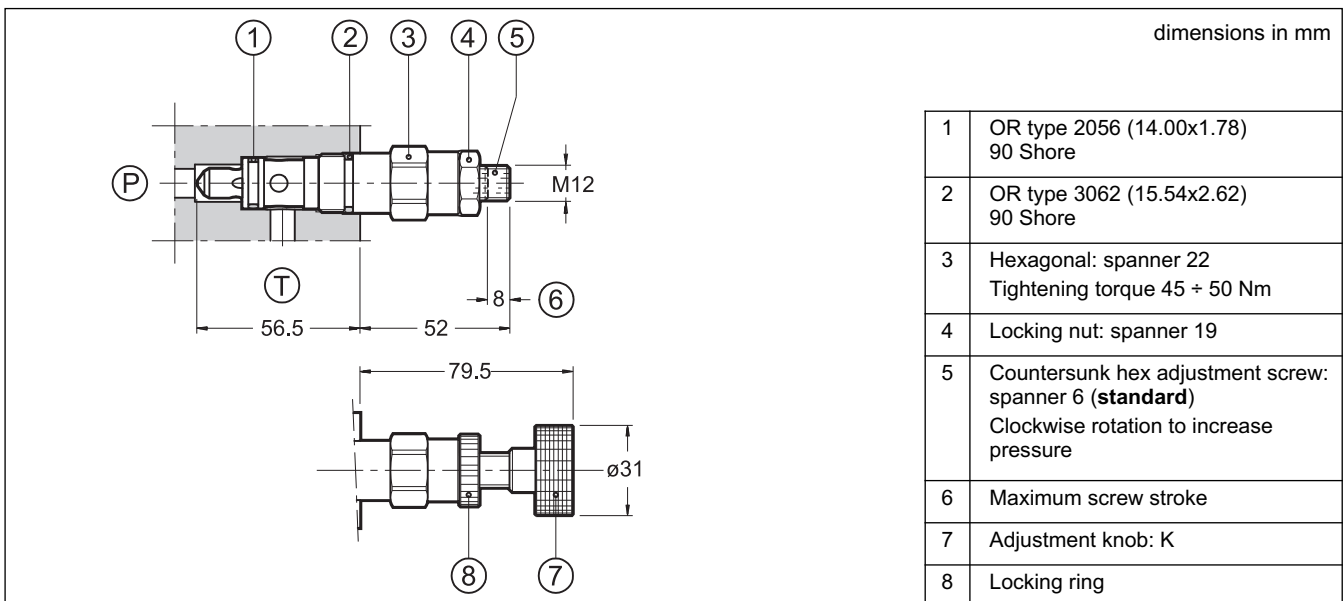
### 2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



### 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





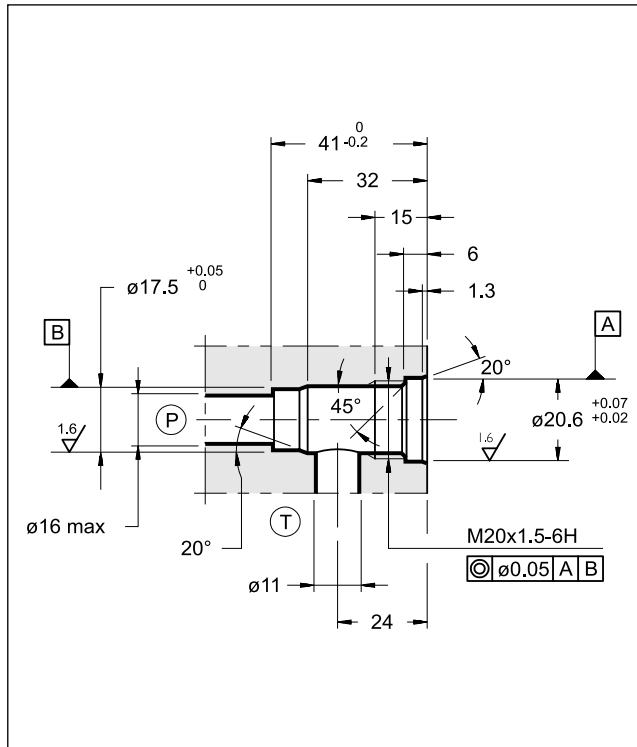
# CRQ

## PILOT OPERATED PRESSURE CONTROL VALVE SERIES 12

### CARTRIDGE TYPE

**p** max 350 bar  
**Q** max 100 l/min

### SEAT DIMENSIONS: D-10C



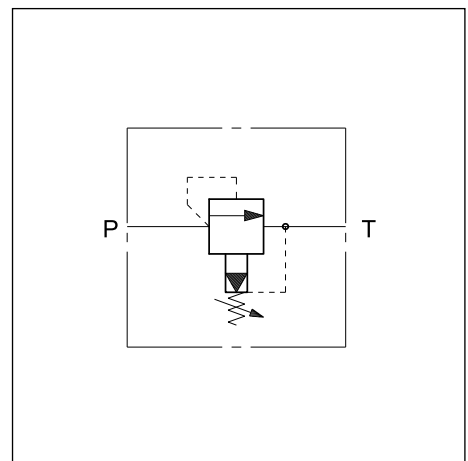
### OPERATING PRINCIPLE

- The CRQ valve is a pilot operated pressure control valve cartridge type that can be used in blocks or panels with D-10C type seat.
- It is normally 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 is available in four different pressure control ranges up to 350 bar.
- 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.
- The pressure is adjustable with a screw, usually supplied as the countersunk hex type, equipped with locking nut and with maximum adjustment limiter.

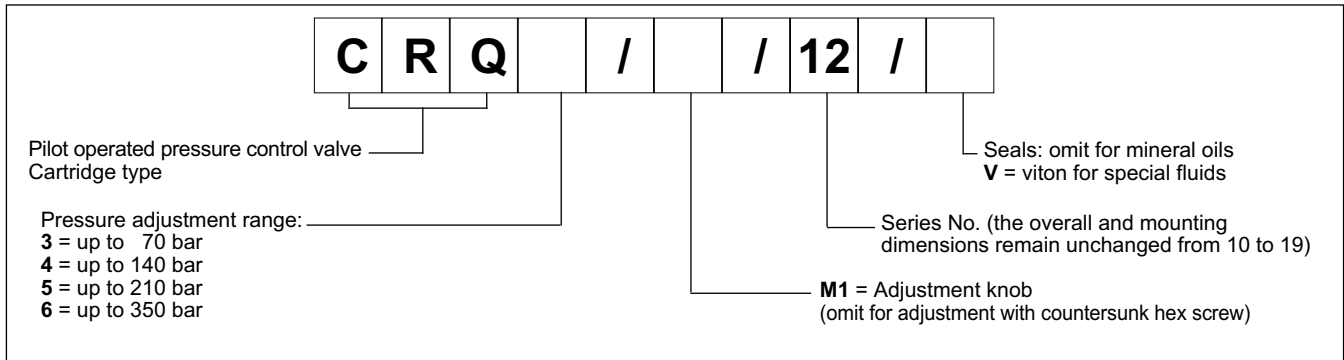
### PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

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	

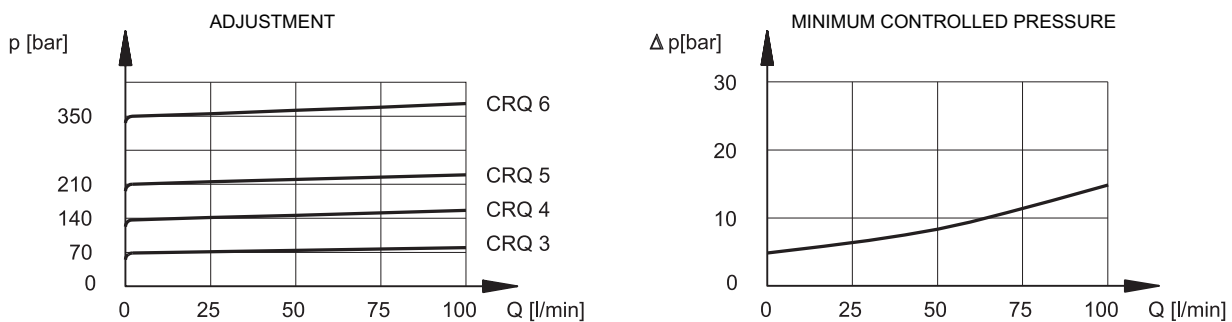
### HYDRAULIC SYMBOL



### 1 - IDENTIFICATION CODE



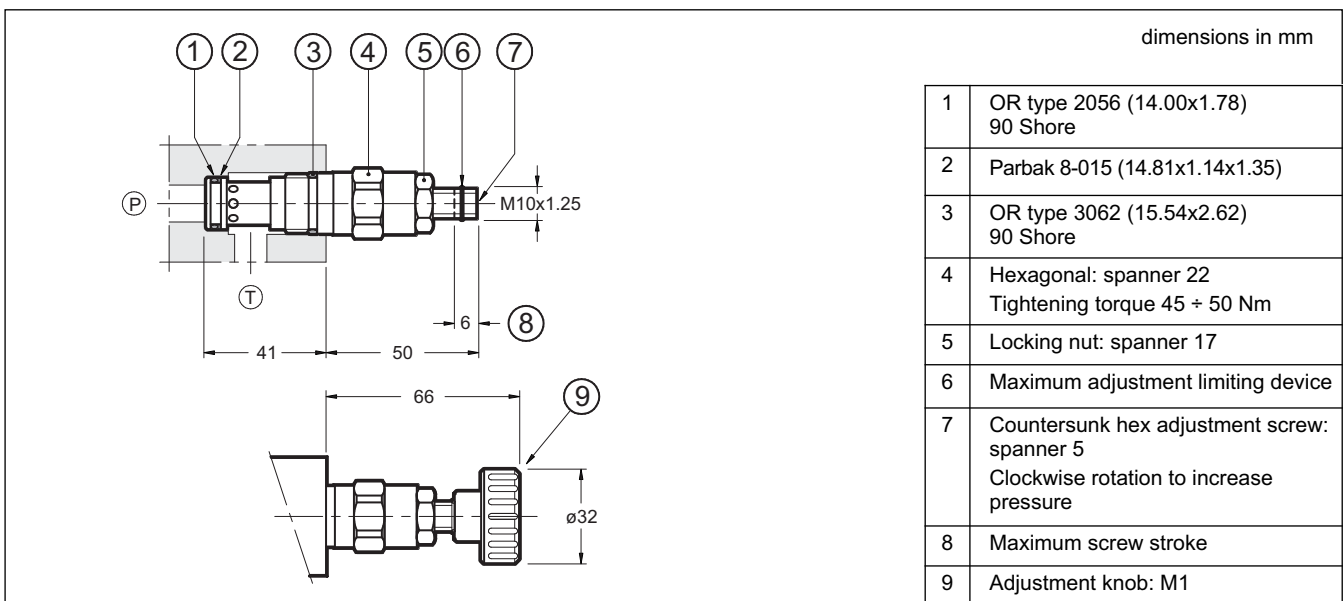
### 2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



### 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





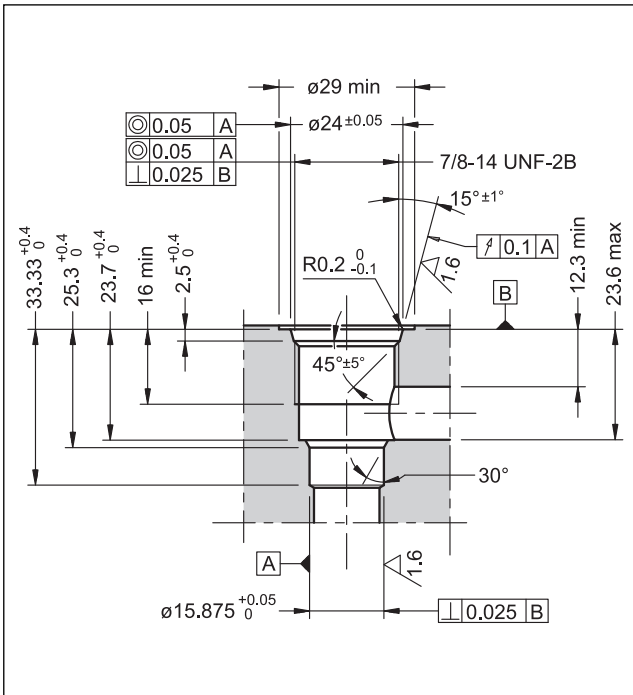
# PRK10

## PILOT OPERATED PRESSURE CONTROL VALVE SERIES 12

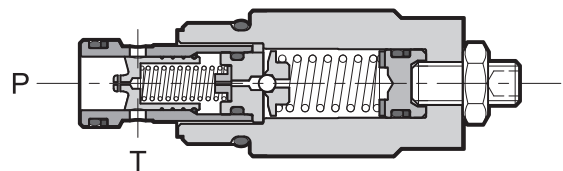
**CARTRIDGE TYPE**  
seat 7/8-14 UNF-2B (SAE - 10)

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

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



### OPERATING PRINCIPLE



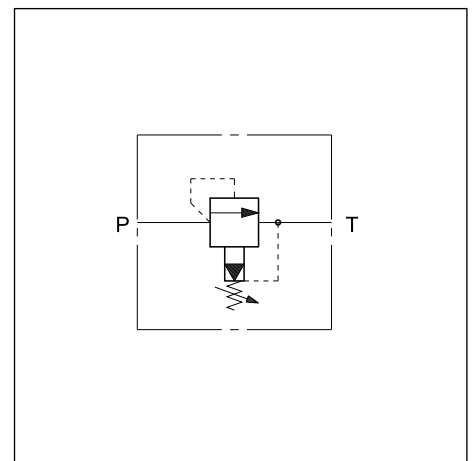
- The PRK10 valve is a pilot operated pressure control valve, cartridge type, that can be used in blocks or panels with 7/8-14 UNF-2B (SAE - 10) type seat.
- It is used to control the hydraulic circuit pressure and allows use of the entire flow of the pump even at pressure values near the set value.
- 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

<b>P</b>	<b>R</b>	<b>K</b>	<b>10</b>	<b>-</b>	<b>/</b>	<b>12</b>	<b>/</b>	
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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**)

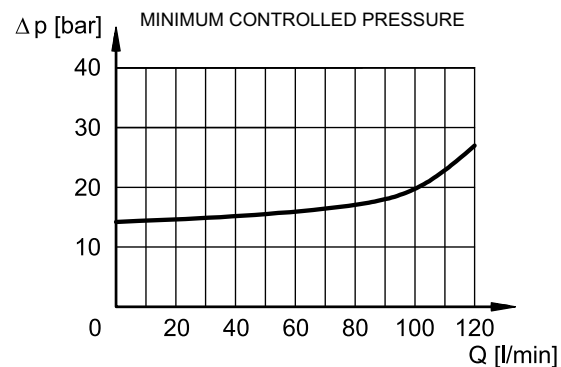
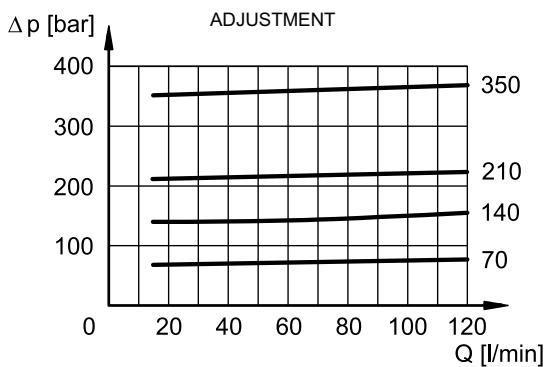
Seals:  
**N** = NBR seals for mineral oils (**standard**)  
**V** = FPM seals for special fluids

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

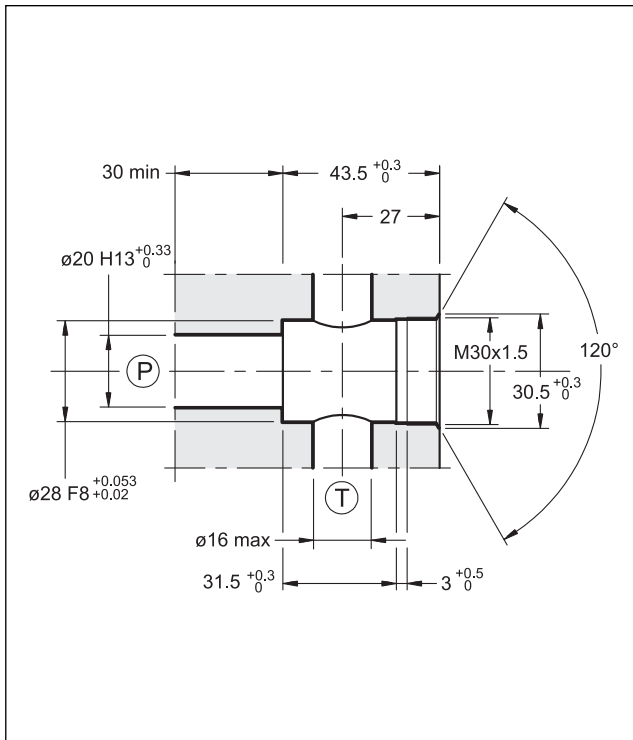
## DIRECT OPERATED PRESSURE CONTROL VALVE

### SERIES 10

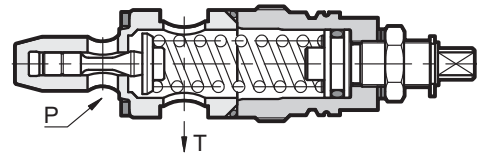
#### CARTRIDGE TYPE

**p** max 380 bar  
**Q** max 120 l/min

#### SEAT DIMENSIONS: D-10E



#### OPERATING PRINCIPLE



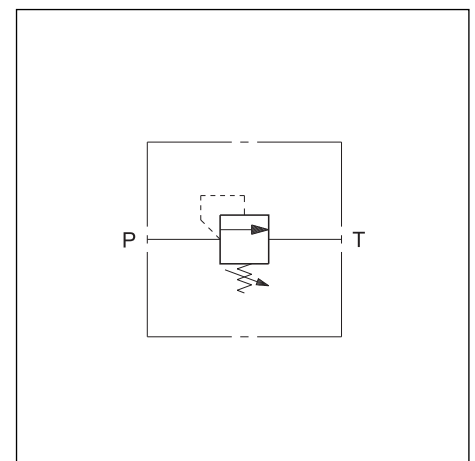
- The DBV valve is a direct operated pressure control valve cartridge type that can be used in blocks or panels with seat.
- It is normally used to control the maximum pressure in the hydraulic circuits or as a limiting device for pressure peaks generated during hydraulic actuator movement variation.
- 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

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

Pressure adjustment range:

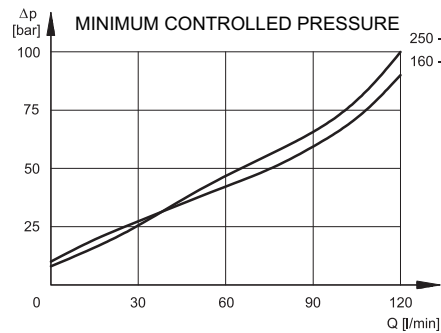
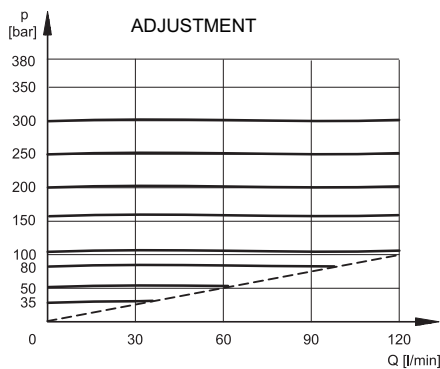
<b>035</b> = up to 35 bar	<b>160</b> = up to 160 bar
<b>050</b> = up to 50 bar	<b>200</b> = up to 200 bar
<b>080</b> = up to 80 bar	<b>250</b> = up to 250 bar
<b>100</b> = up to 100 bar	<b>300</b> = up to 300 bar

**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 ( <b>standard</b> ) 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: <b>K</b>





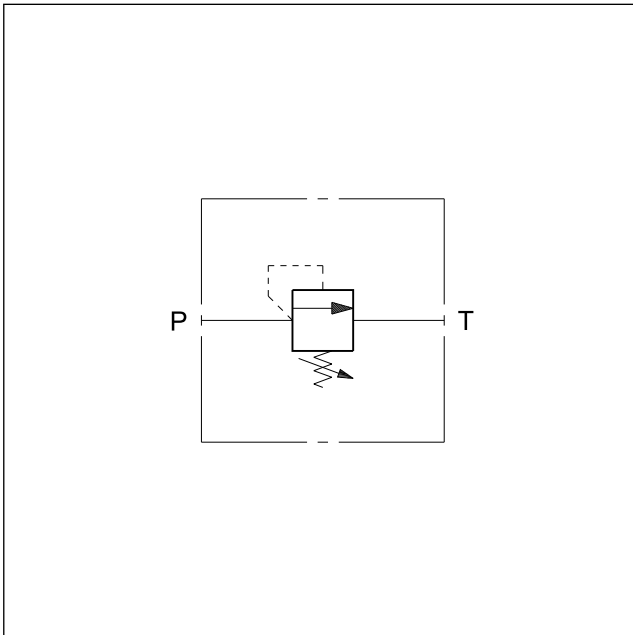
# CD1-W

## DIRECT OPERATED PRESSURE CONTROL VALVE SERIES 10

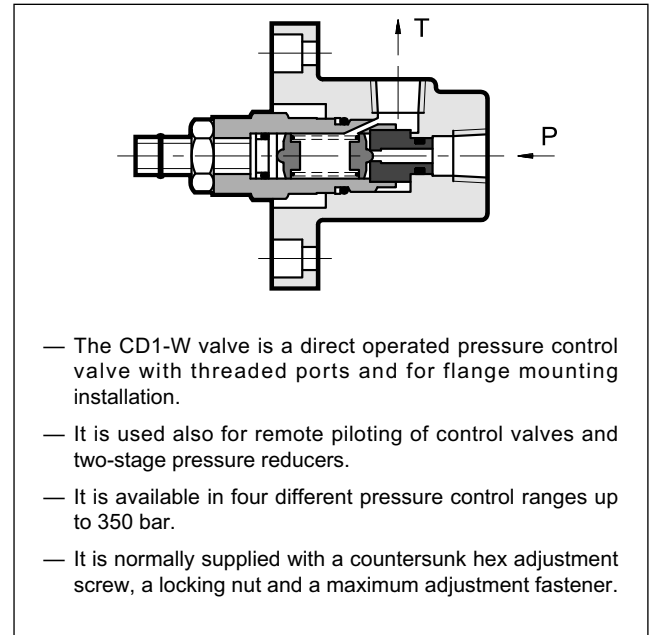
### THREADED PORTS

**p** max 350 bar  
**Q** max 3 l/min

### HYDRAULIC SYMBOL



### OPERATING PRINCIPLE

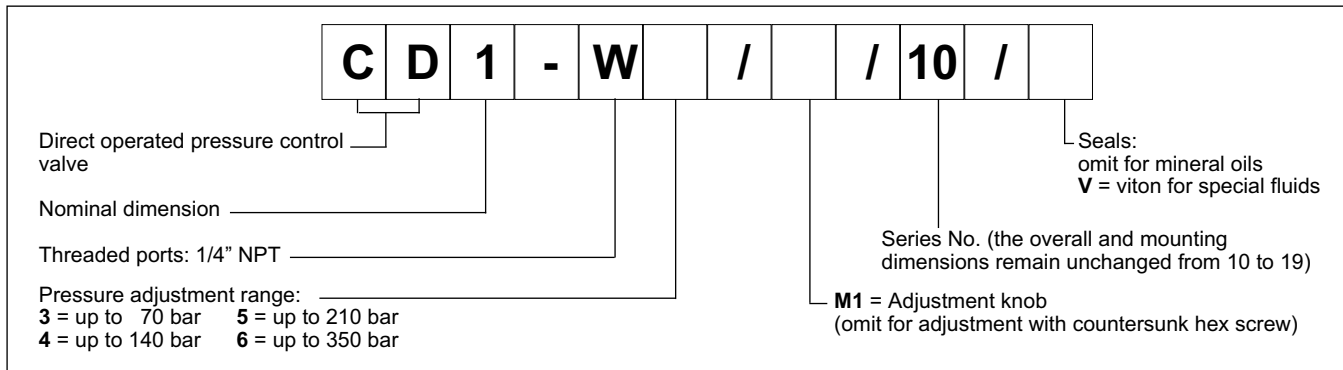


- The CD1-W valve is a direct operated pressure control valve with threaded ports and for flange mounting installation.
- It is used also for remote piloting of control valves and two-stage pressure reducers.
- It is available in four different pressure control ranges up to 350 bar.
- It is normally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

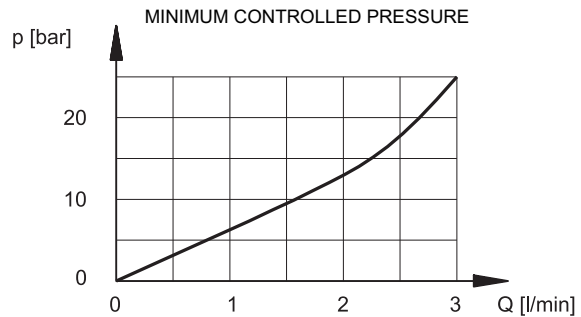
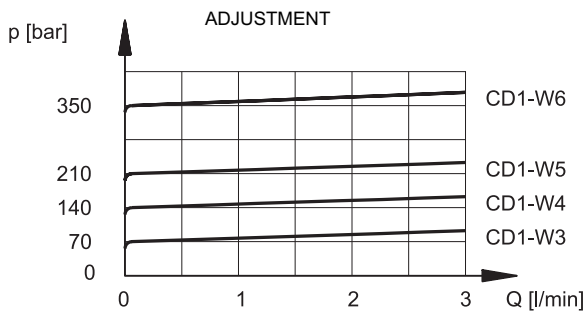
### PERFORMANCE RATINGS (measured with mineral oil of viscosity 36 cSt at 50°C)

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



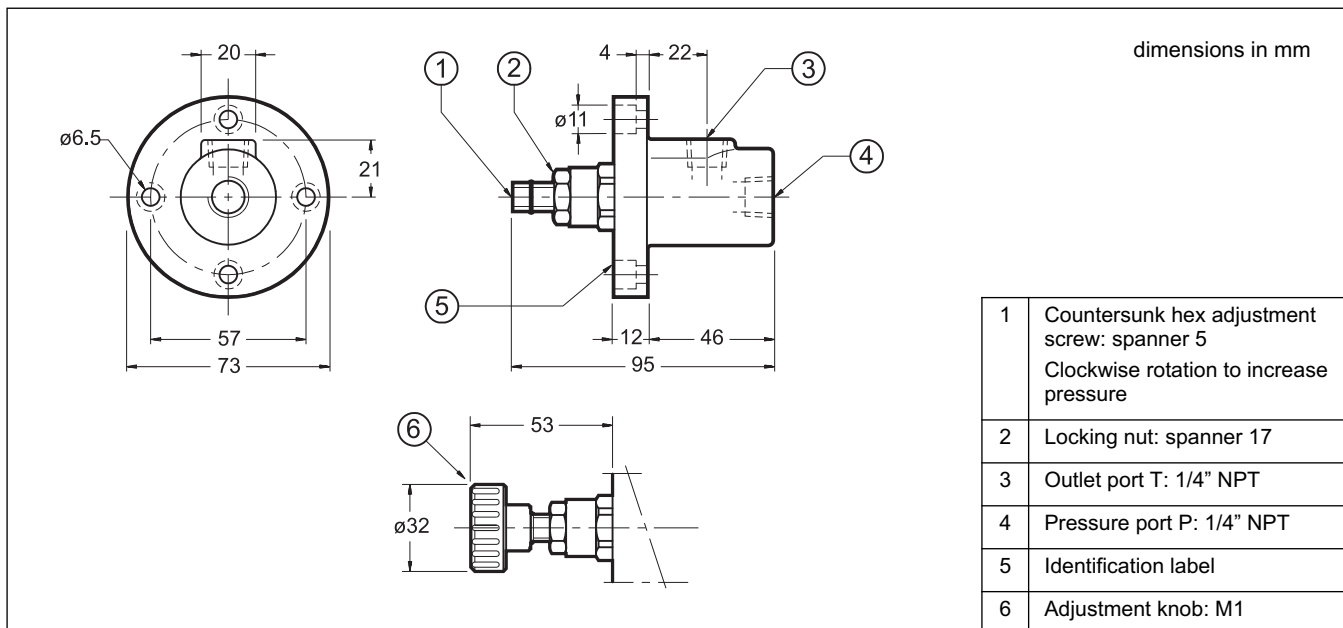
### 2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



### 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

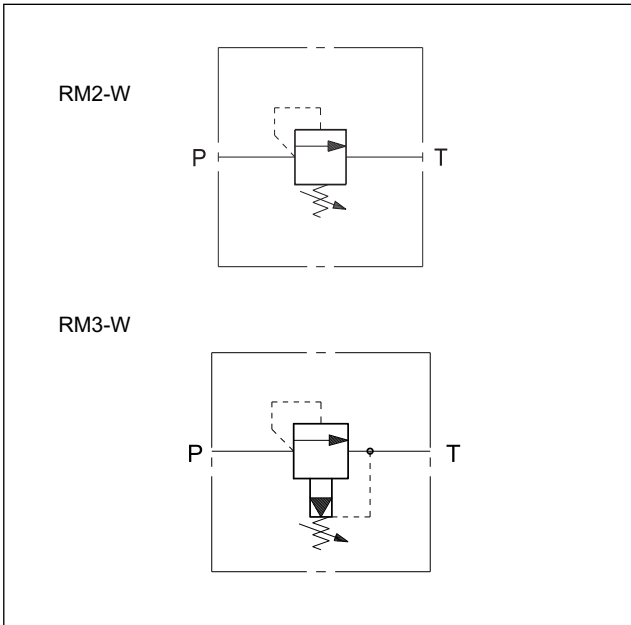
## PRESSURE CONTROL VALVES

RM2-W SERIES 31  
RM3-W SERIES 30

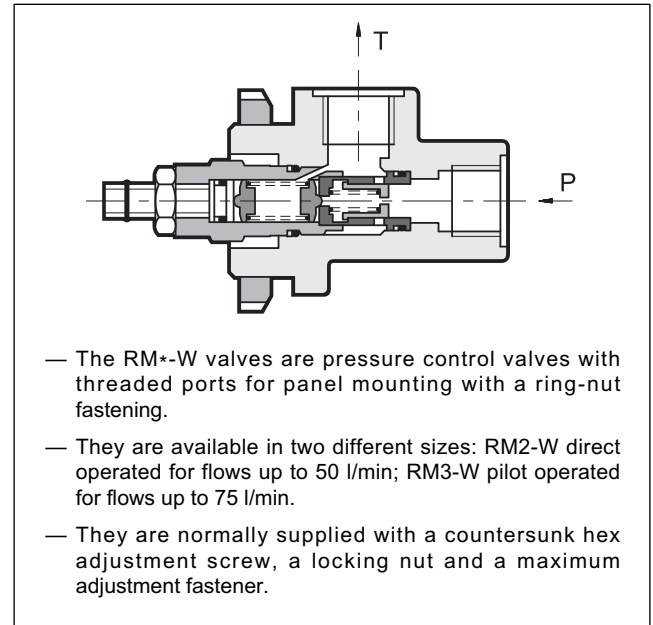
### THREADED PORTS

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

### HYDRAULIC SYMBOLS



### OPERATING PRINCIPLE



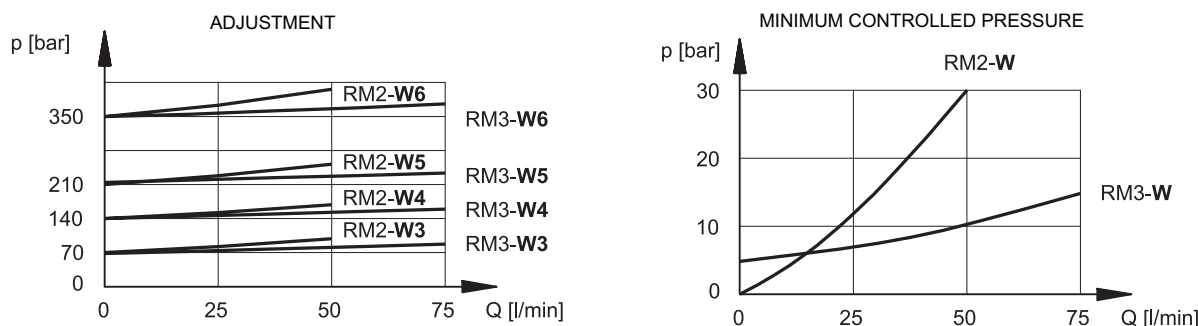
### PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		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**

<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;"><b>R</b></div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px; margin-left: 10px;"><b>M</b></div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px; margin-left: 10px;">-</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px; margin-left: 10px;"><b>W</b></div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px; margin-left: 10px;">/</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px; margin-left: 10px;"> </div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px; margin-left: 10px;"> </div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px; margin-left: 10px;"> </div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px; margin-left: 10px;"> </div>	<p style="text-align: right;"><b>Example:</b> RM2-W3/31N/K RM3-W3/M1/30/V</p> <p>Pressure control valve</p> <p>Nominal dimension: 2 = 3/8"    3 = 1/2"</p> <p>Threaded ports BSP</p> <p>Pressure adjustment range: 3 = up to 70 bar    5 = up to 210 bar 4 = up to 140 bar    6 = up to 350 bar</p> <p style="text-align: right;">only for RM2: /K = Adjustment knob (omit for adjustment with countersunk hex screw)</p> <p style="text-align: right;">only for RM3: Seals Omit for NBR seals for mineral oils (<b>standard</b>) /V = FPM seals for special fluids</p> <p style="text-align: right;">Series no:    <b>31</b> for RM2-W    <b>30</b> for RM3-W</p> <p style="text-align: right;">only for RM2: Seals <b>N</b> = NBR seals for mineral oils (<b>standard</b>) <b>V</b> = FPM seals for special fluids</p> <p style="text-align: right;">only for RM3: <b>M1</b> = Adjustment knob (omit for adjustment with countersunk hex screw)</p>
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**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**

<p>dimensions in mm</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center;">1</td> <td>Countersunk hex adjustment screw: <b>RM2-W:</b> spanner 6 <b>RM3-W:</b> spanner 5 Clockwise rotation to increase pressure</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Locking nut: <b>RM2-W:</b> spanner 19 <b>RM3-W:</b>spanner 17</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Ring-nut for flange mounting type SKF KM9</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Outlet port 1/2" BSP</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Pressure port: <b>RM2-W:</b> 3/8" BSP <b>RM3-W:</b> 1/2" BSP</td> </tr> <tr> <td style="text-align: center;">6</td> <td>Adjustment knob: <b>RM3-W:</b> M1</td> </tr> <tr> <td style="text-align: center;">7</td> <td>Adjustment knob: <b>RM2-W:</b> K</td> </tr> <tr> <td style="text-align: center;">8</td> <td>Locking ring</td> </tr> </table>	1	Countersunk hex adjustment screw: <b>RM2-W:</b> spanner 6 <b>RM3-W:</b> spanner 5 Clockwise rotation to increase pressure	2	Locking nut: <b>RM2-W:</b> spanner 19 <b>RM3-W:</b> spanner 17	3	Ring-nut for flange mounting type SKF KM9	4	Outlet port 1/2" BSP	5	Pressure port: <b>RM2-W:</b> 3/8" BSP <b>RM3-W:</b> 1/2" BSP	6	Adjustment knob: <b>RM3-W:</b> M1	7	Adjustment knob: <b>RM2-W:</b> K	8	Locking ring
1	Countersunk hex adjustment screw: <b>RM2-W:</b> spanner 6 <b>RM3-W:</b> spanner 5 Clockwise rotation to increase pressure																
2	Locking nut: <b>RM2-W:</b> spanner 19 <b>RM3-W:</b> spanner 17																
3	Ring-nut for flange mounting type SKF KM9																
4	Outlet port 1/2" BSP																
5	Pressure port: <b>RM2-W:</b> 3/8" BSP <b>RM3-W:</b> 1/2" BSP																
6	Adjustment knob: <b>RM3-W:</b> M1																
7	Adjustment knob: <b>RM2-W:</b> K																
8	Locking ring																



# RQ\*-W

## PRESSURE RELIEF VALVE

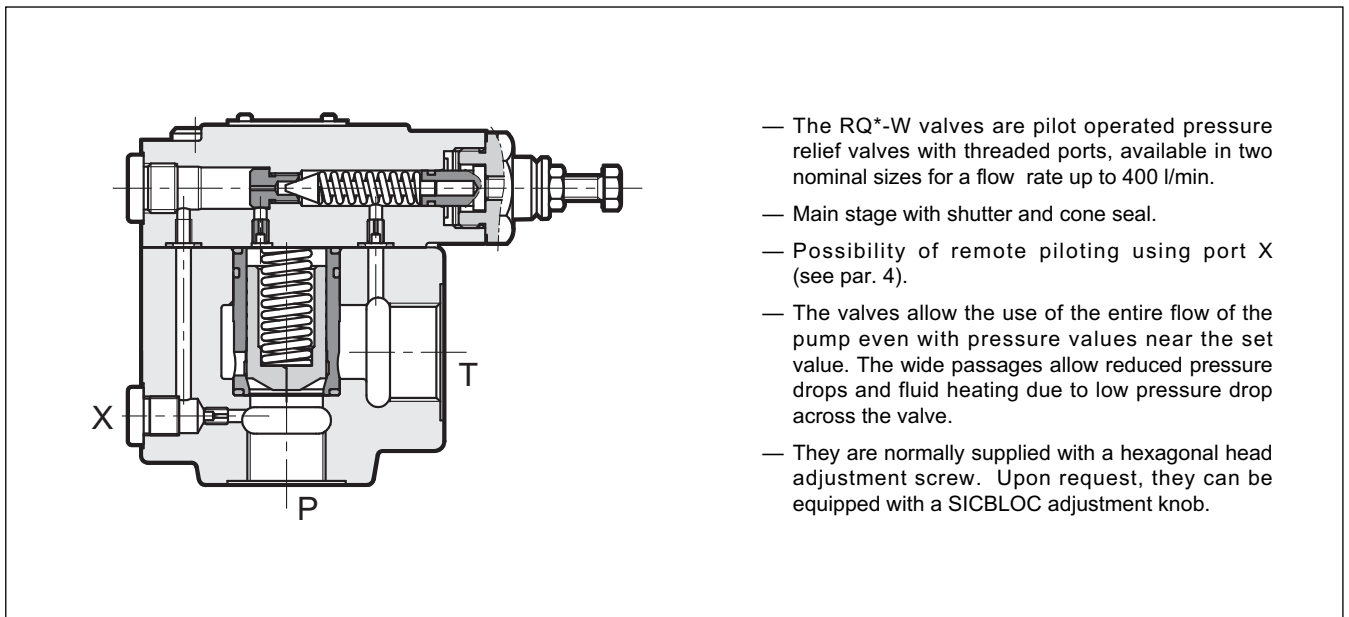
### SERIES 41

#### THREADED PORTS

**p** max 350 bar

**Q** max (see table of performances)

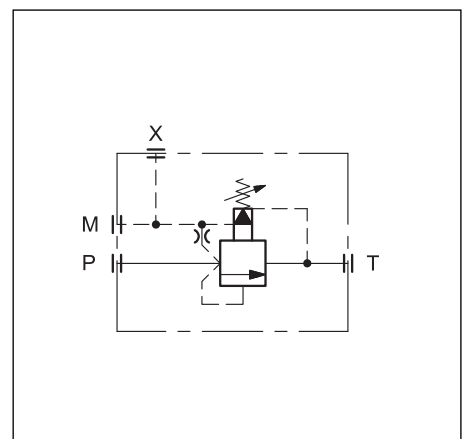
#### OPERATING PRINCIPLE



#### 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

	<b>R</b>	<b>Q</b>	<b>-</b>	<b>W</b>	<b>/</b>	<b>/</b>	<b>41</b>	<b>/</b>	
--	----------	----------	----------	----------	----------	----------	-----------	----------	--

Pressure control valve \_\_\_\_\_

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

BSP threaded ports \_\_\_\_\_

Pressure adjustment range: \_\_\_\_\_

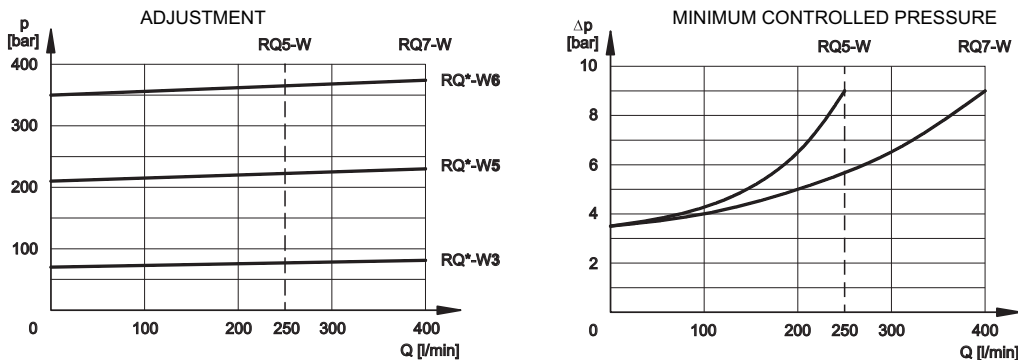
**3** = up to 70 bar  
**5** = up to 210 bar  
**6** = up to 350 bar

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
<b>RQ5-W</b>	168	98	49	4	22	21.5	44.5	123	80	87	53	35.5	46
<b>RQ7-W</b>	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

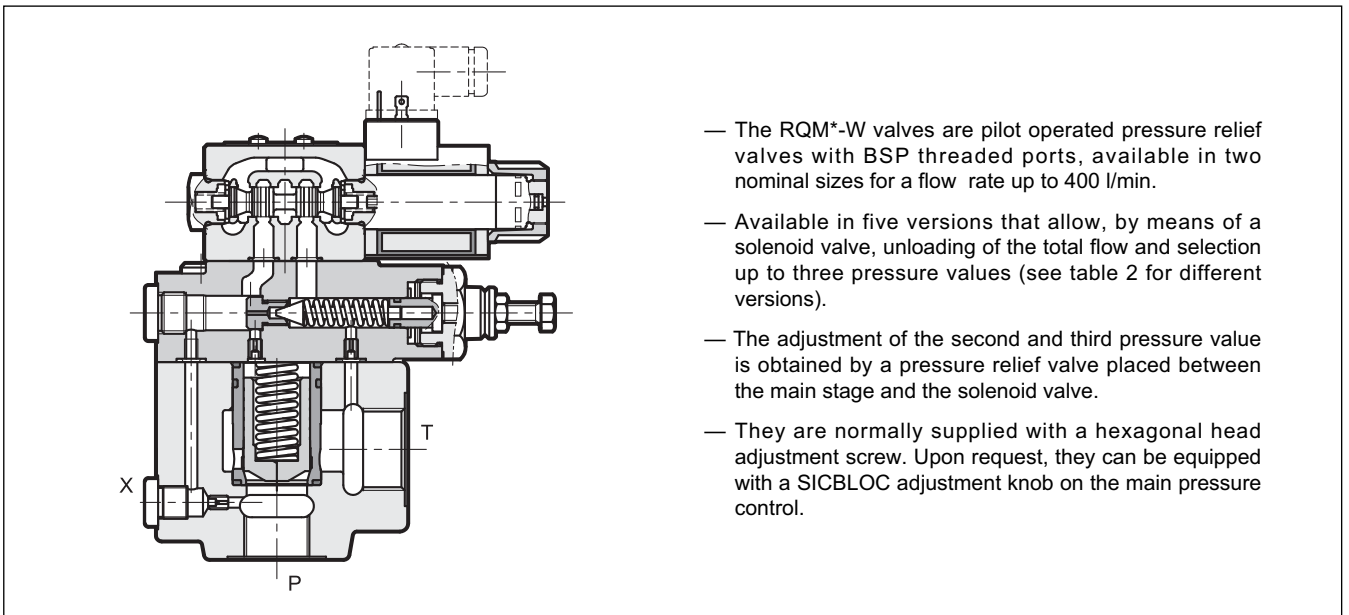
SERIES 60

### 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

<b>R</b>	<b>Q</b>	<b>M</b>	<b>- W</b>	<b>/</b>	<b>/</b>	<b>/ 60</b>	<b>-</b>	<b>K1</b>	<b>/</b>
----------	----------	----------	------------	----------	----------	-------------	----------	-----------	----------

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**)

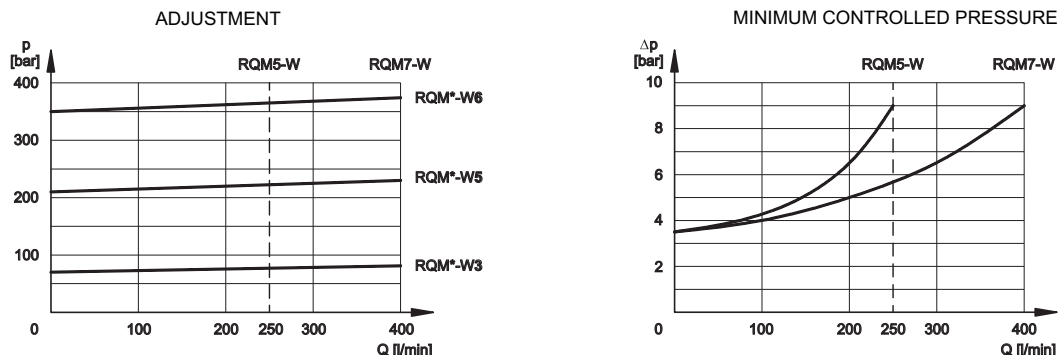
**F110** = 110 V - 60 Hz  
**F220** = 220 V - 60 Hz

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><b>1 pressure setting and unloading with de-energized solenoid</b></p>	<p><b>1 pressure setting and unloading with energized solenoid</b></p>	<p><b>2 pressure settings</b> The highest setting is reached with energized solenoid</p>	<p><b>2 pressure settings and unloading with de-energized solenoids</b></p>	<p><b>3 pressure settings</b> The highest setting is reached with de-energized solenoids</p>

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

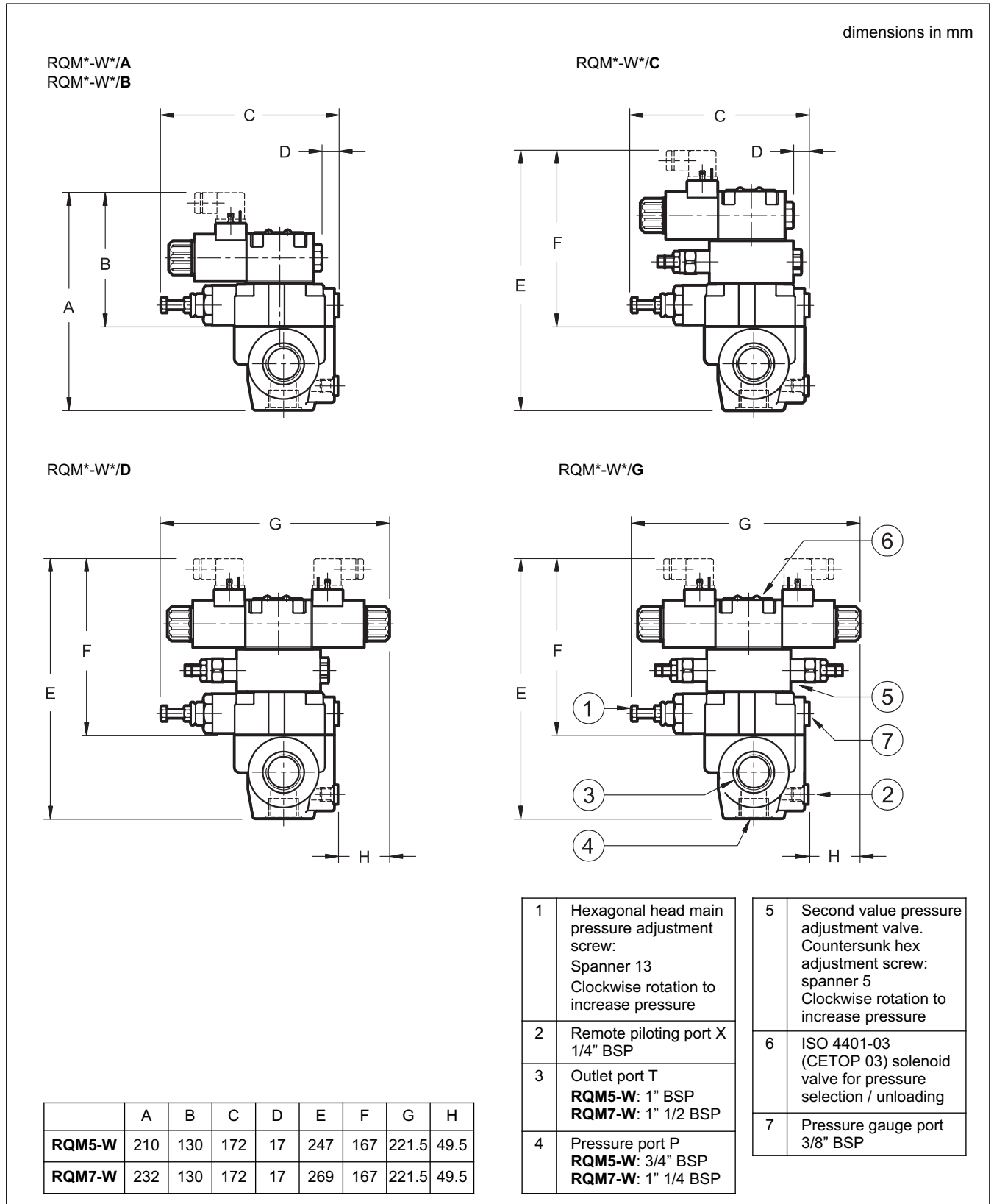




## 4 - HYDRAULIC FLUIDS

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

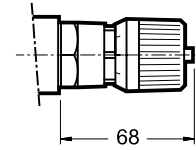




## 6 - ADJUSTMENT KNOB

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

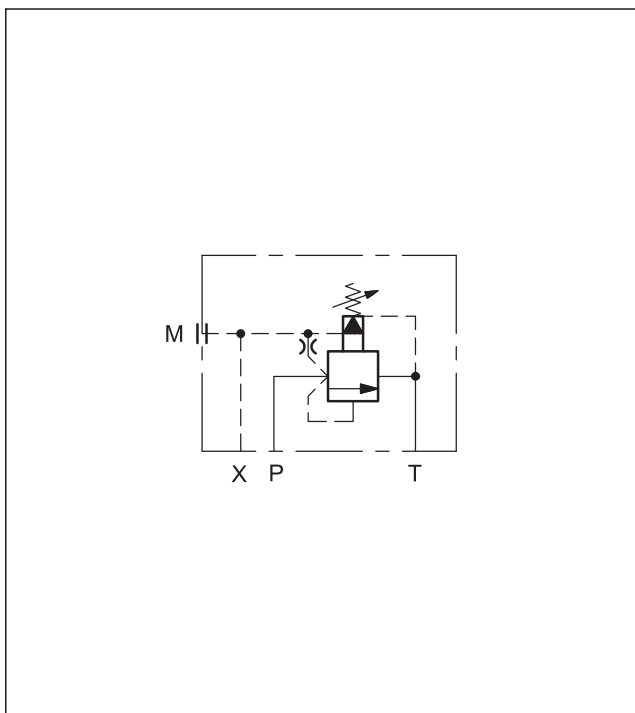
#### SUBPLATE MOUNTING

RQ3-P ISO 6264-06

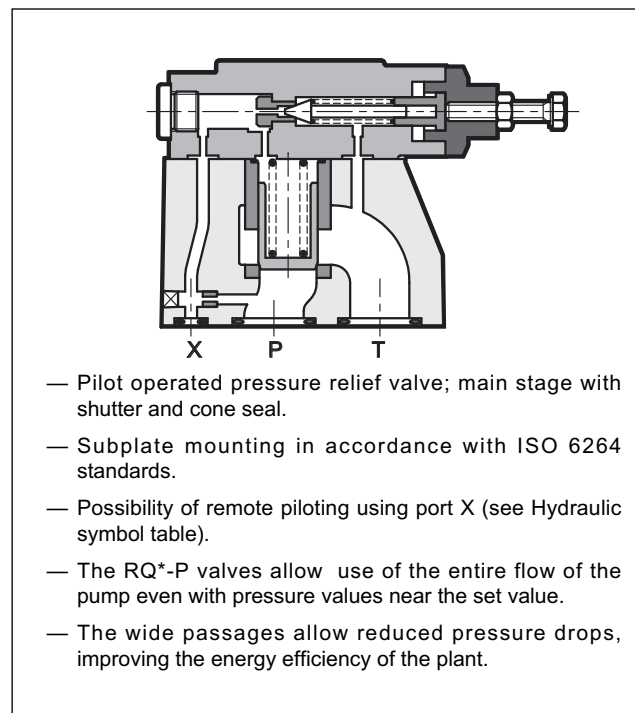
RQ5-P ISO 6264-08

RQ7-P ISO 6264-10

#### HYDRAULIC SYMBOL



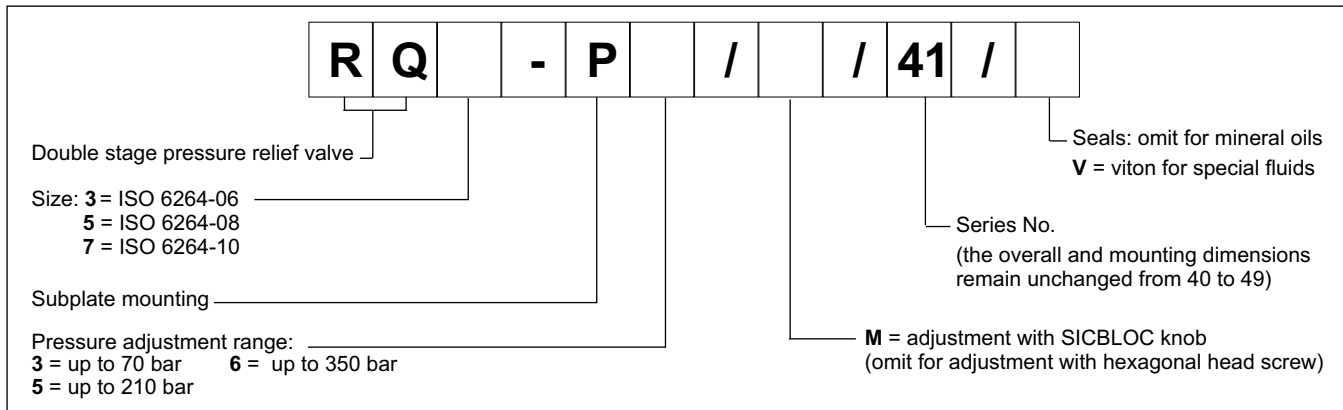
#### OPERATING PRINCIPLE



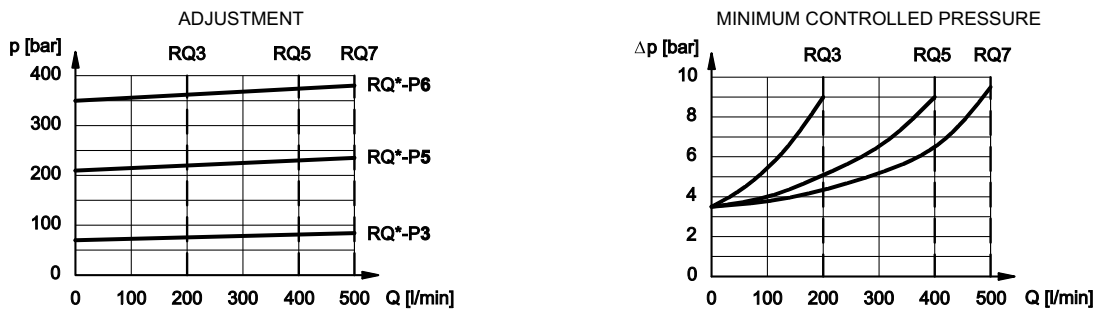
#### PERFORMANCES (measured with mineral oil of viscosity 36 cSt at 50°C)

		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)

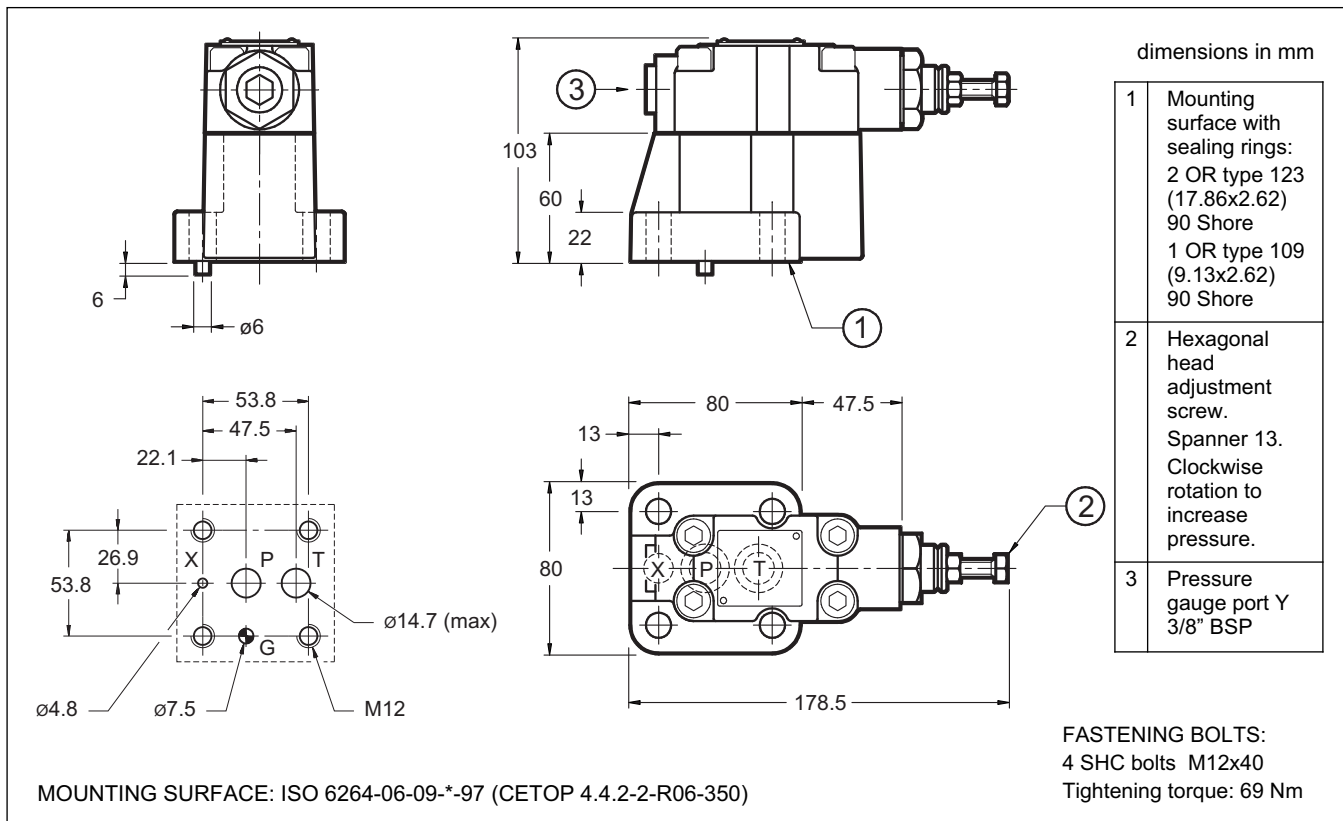


### 3 - HYDRAULIC FLUIDS

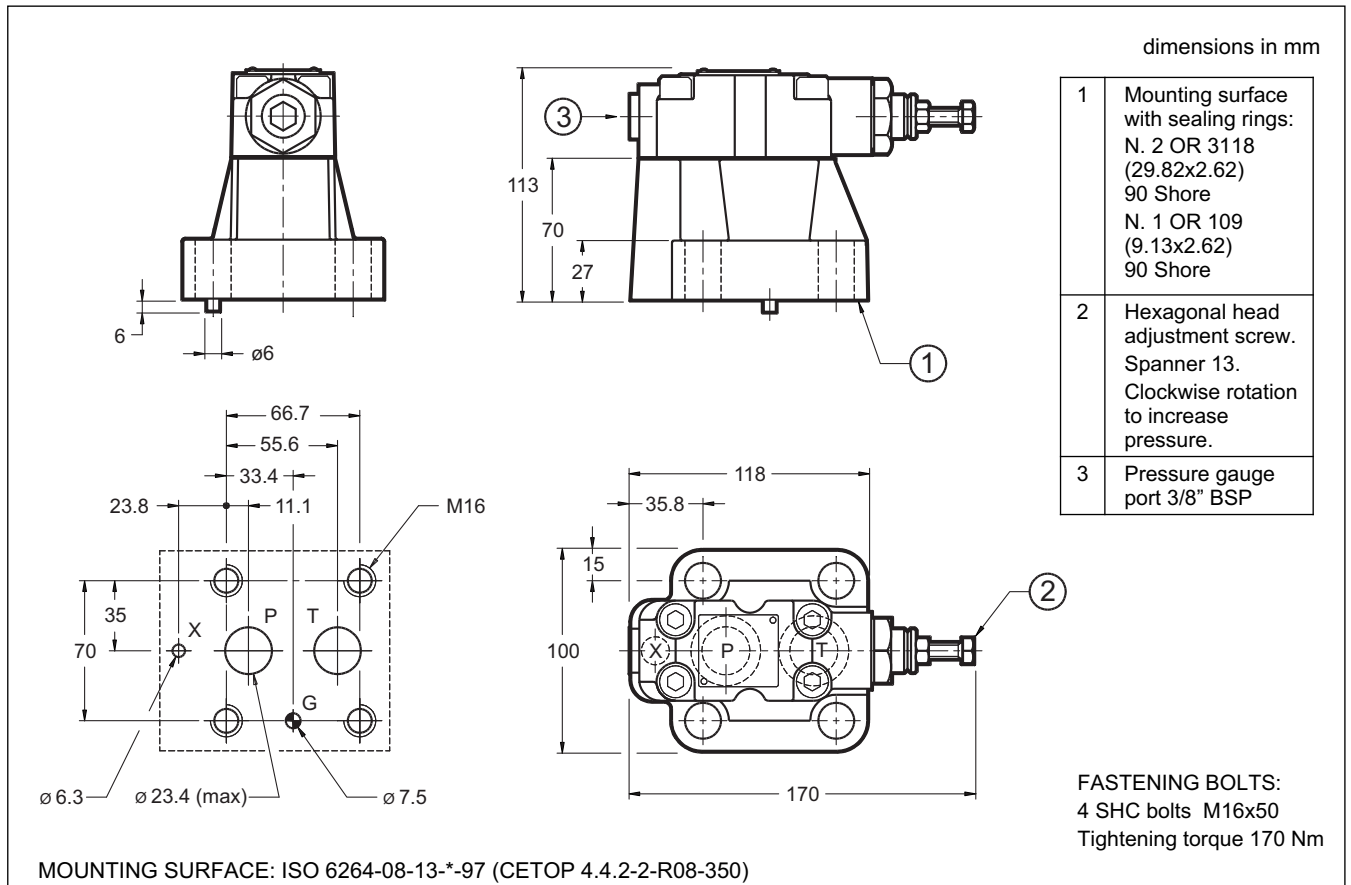
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures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

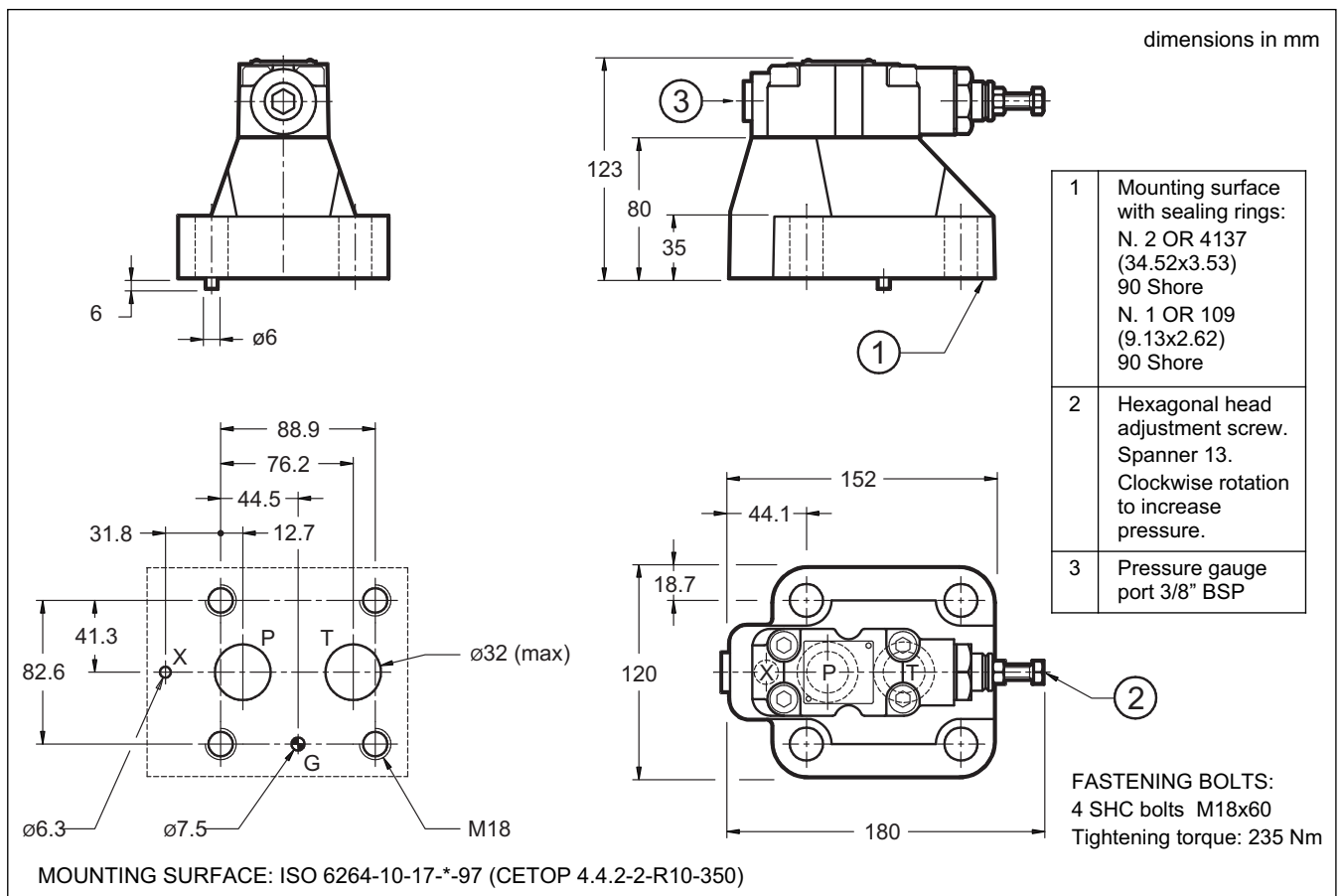
### 4 - RQ3-P OVERALL AND MOUNTING DIMENSIONS



### 5 - RQ5-P OVERALL AND MOUNTING DIMENSIONS



### 6 - RQ7-P OVERALL AND MOUNTING DIMENSIONS

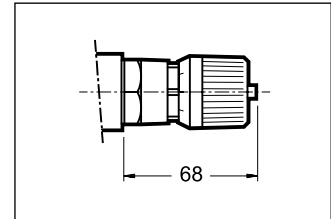




## 7 - ADJUSTMENT KNOB

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

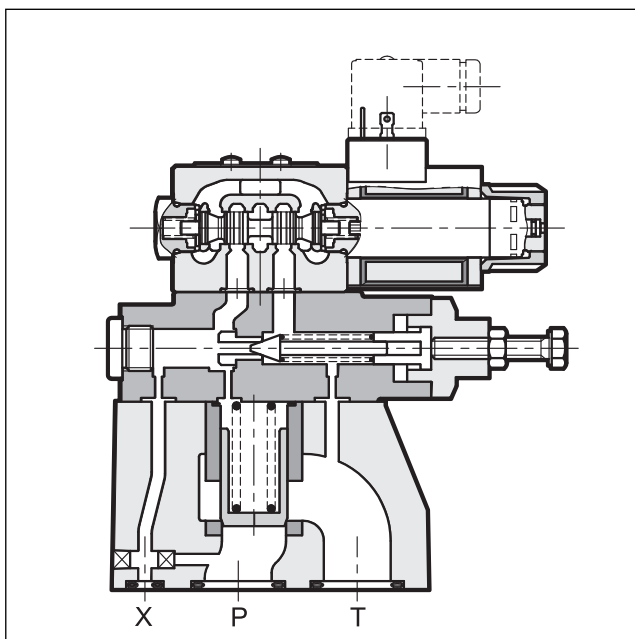
### SUBPLATE MOUNTING

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

<b>R</b>	<b>Q</b>	<b>M</b>	<b>-</b>	<b>P</b>	/	/	/	<b>60</b>	<b>-</b>	<b>K1</b>	/
----------	----------	----------	----------	----------	---	---	---	-----------	----------	-----------	---

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** } see description  
**B** } in hydraulic symbols  
**C** } table  
**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 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

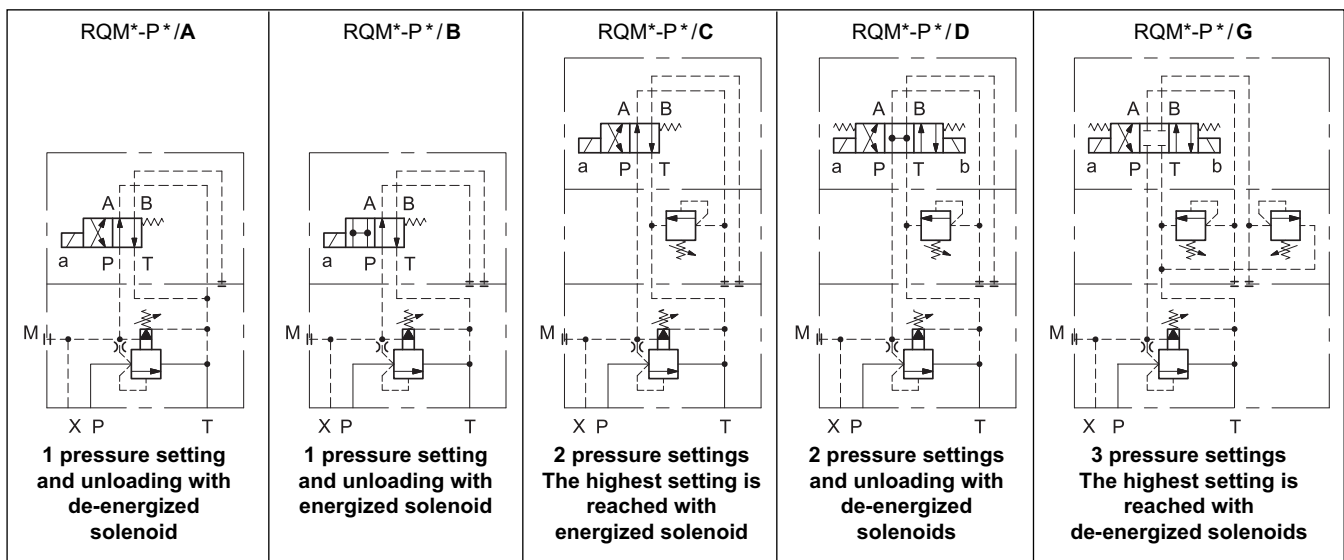
Coil electrical connection: plug for connector type EN 175301-803 (ex DIN 43650) (**standard**)

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

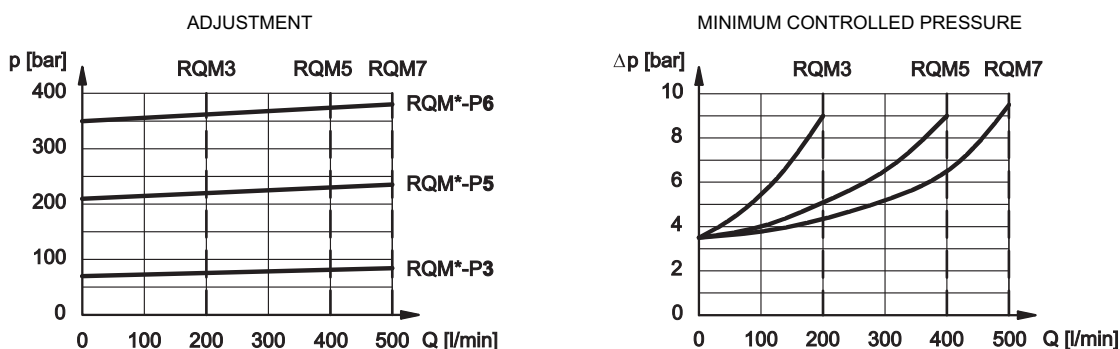
AC power supply  
**A24** = 24 V - 50 Hz  
**A48** = 48 V - 50 Hz  
**A110** = 110 V - 50 Hz / 120 V - 60 Hz  
**A230** = 230 V - 50 Hz / 240 V - 60 Hz  
**A00** = valve without coils (see **NOTE**)  
**F110** = 110 V - 60 Hz  
**F220** = 220 V - 60 Hz

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)

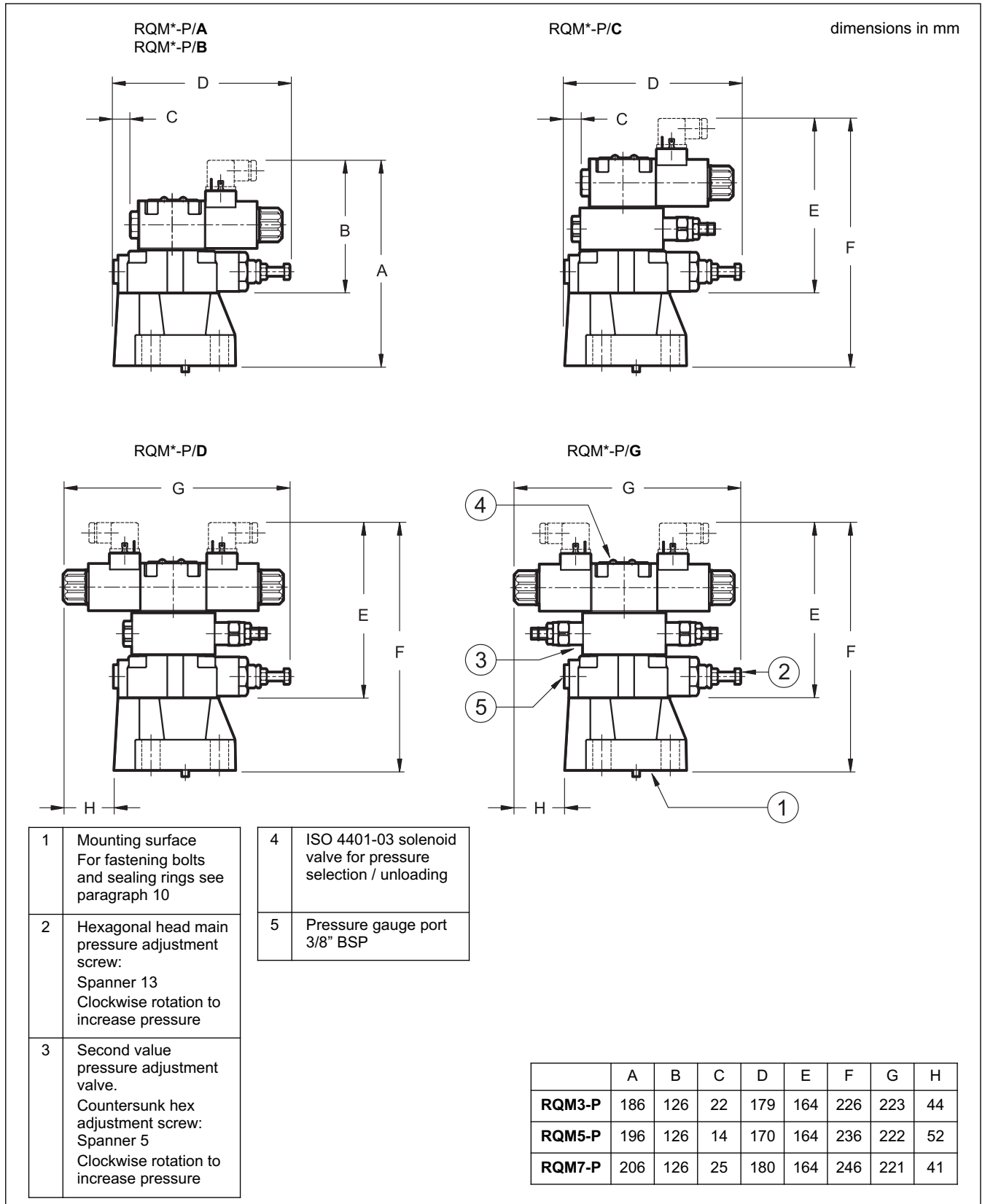




### 4 - HYDRAULIC FLUIDS

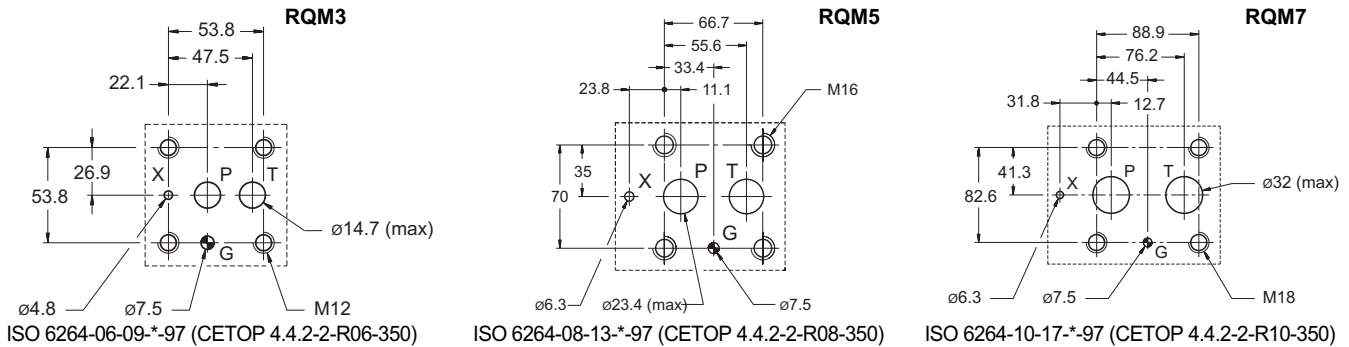
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at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



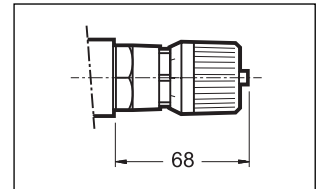
### 7 - ADJUSTMENT KNOB

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.

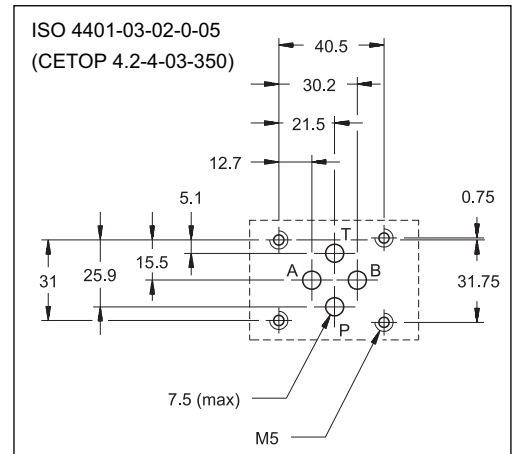
In order to assure this operation, it is necessary to use an accumulator (see hydraulic diagram) that guarantees pressure maintenance in the circuit. A check valve, incorporated in the panel or available as a plate under the valve MRQA/C, prevents the accumulator unloading through the open valve.

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

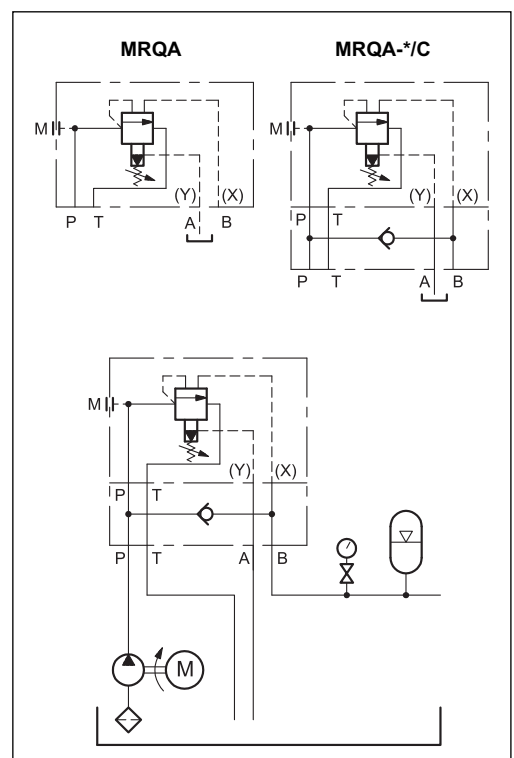
It is recommended to place the accumulator as close as possible to the MRQA, without reducing the connection size.

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

#### MOUNTING SURFACE



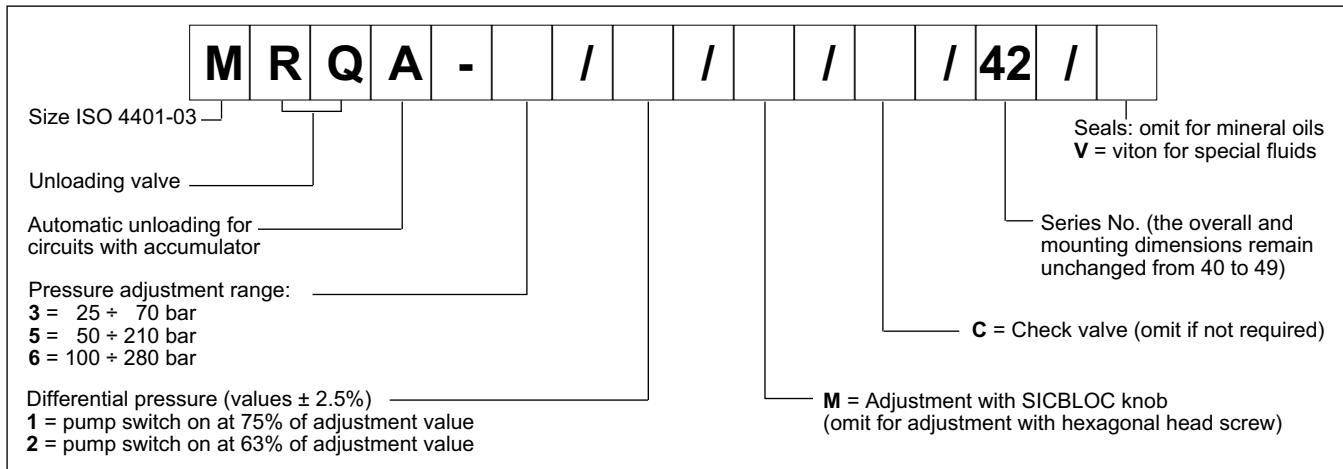
#### HYDRAULIC SYMBOLS & DIAGRAM



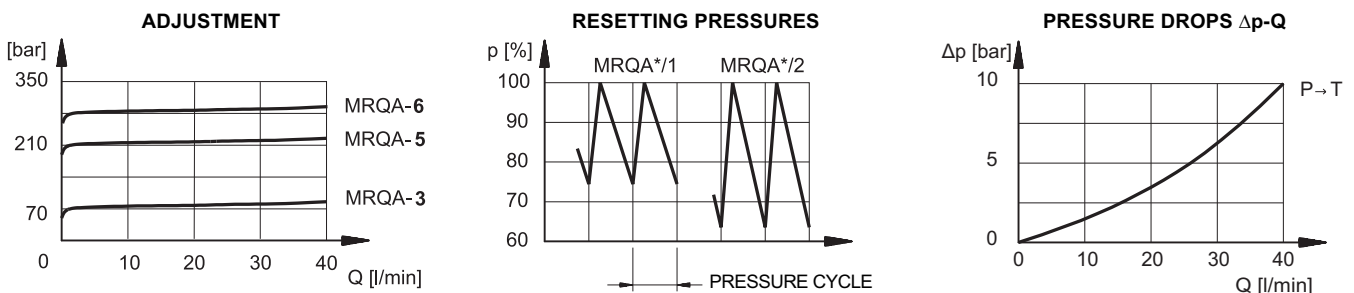
#### PERFORMANCE RATINGS (measured with mineral oil of viscosity 36 cSt at 50°C)

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



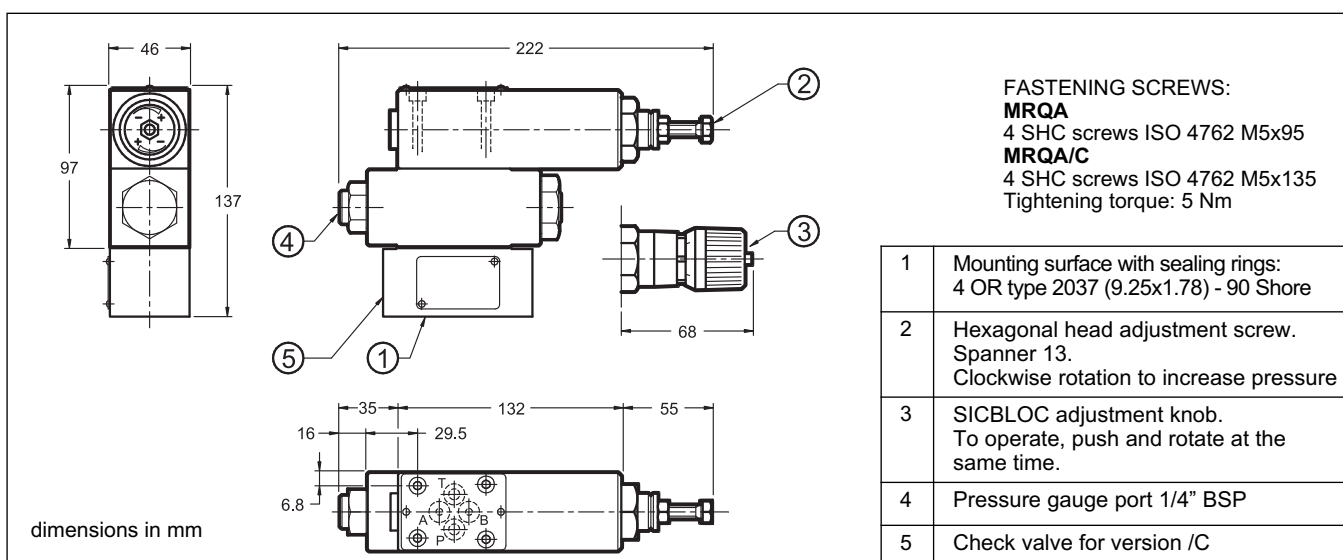
### 2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

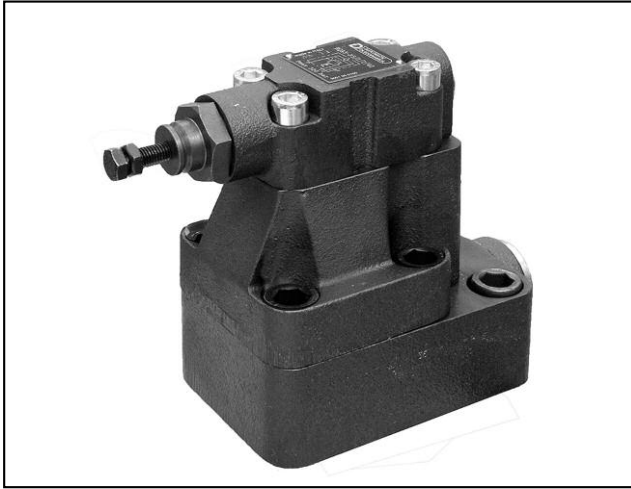


### 3 - HYDRAULIC FLUIDS

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





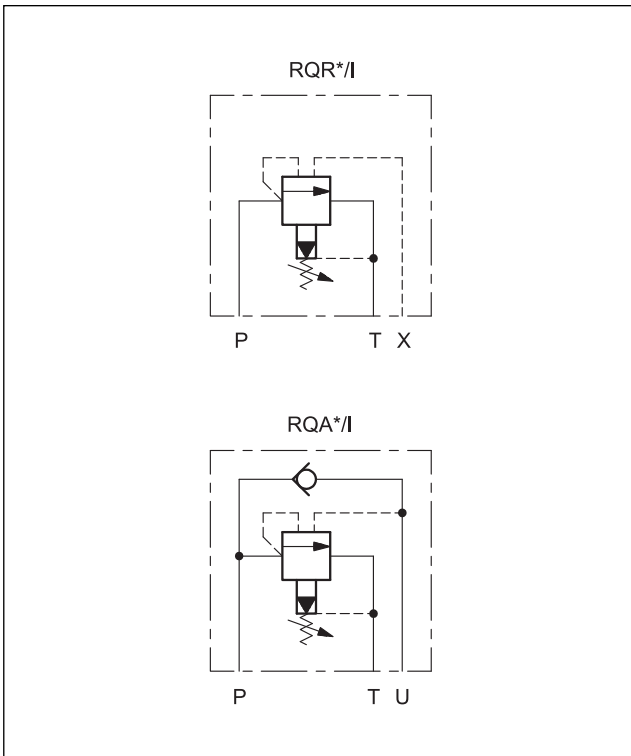
**RQ\*\*-P**  
**UNLOADING VALVE**  
(FOR CIRCUITS WITH ACCUMULATOR)  
**SERIES 42**

**RQR\*-P**  
FOR REMOTE PILOTING

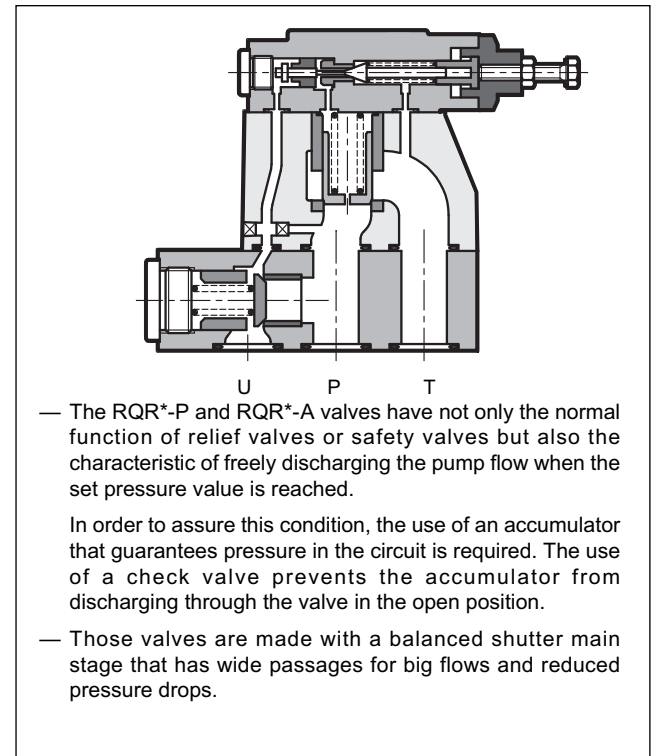
**RQA\*-P**  
WITH INCORPORATED CHECK VALVE

**SUBPLATE MOUNTING**

**HYDRAULIC SYMBOLS**



**OPERATING PRINCIPLE**



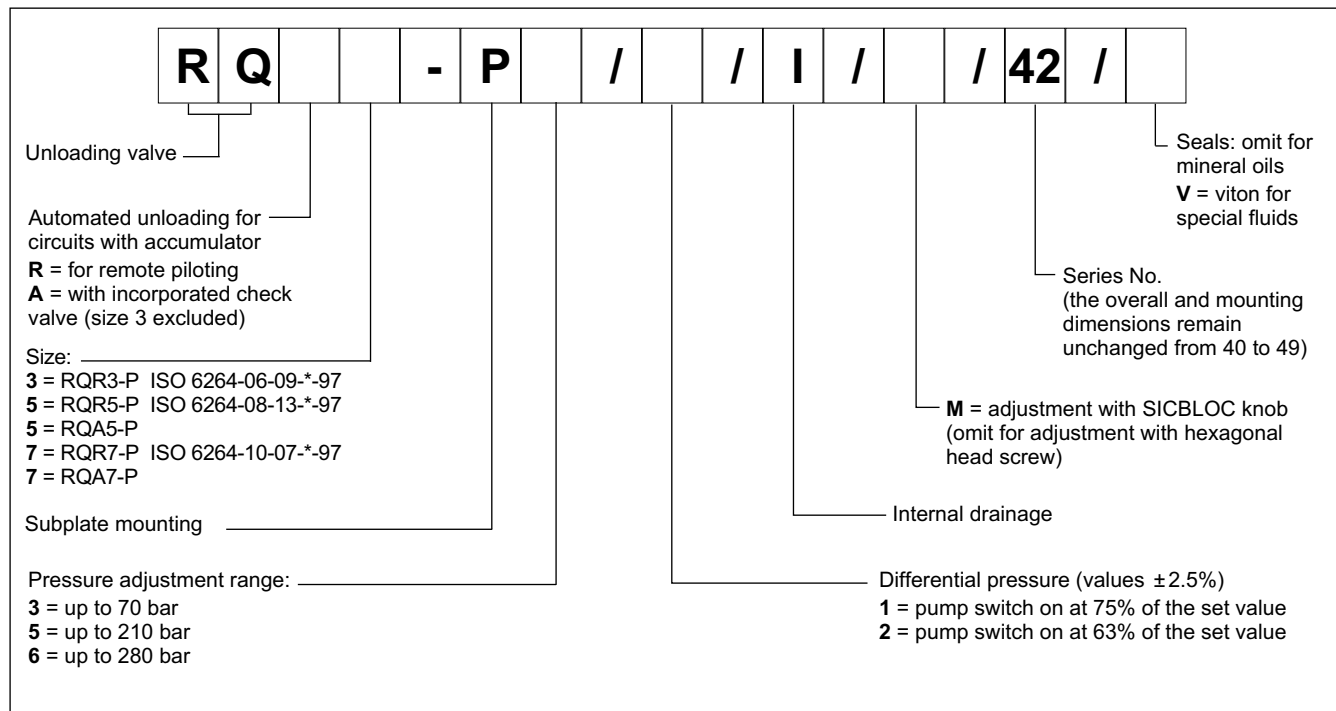
**PERFORMANCES**

(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

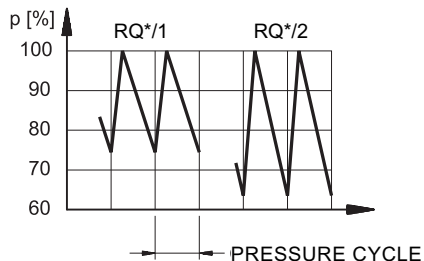
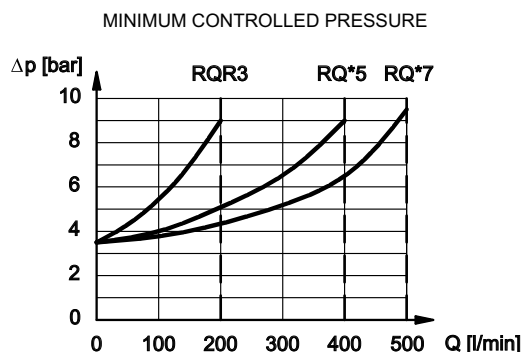
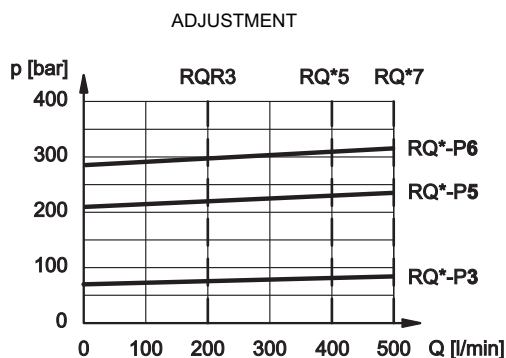


## 1 - IDENTIFICATION CODE



## 2 - CHARACTERISTIC CURVES

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

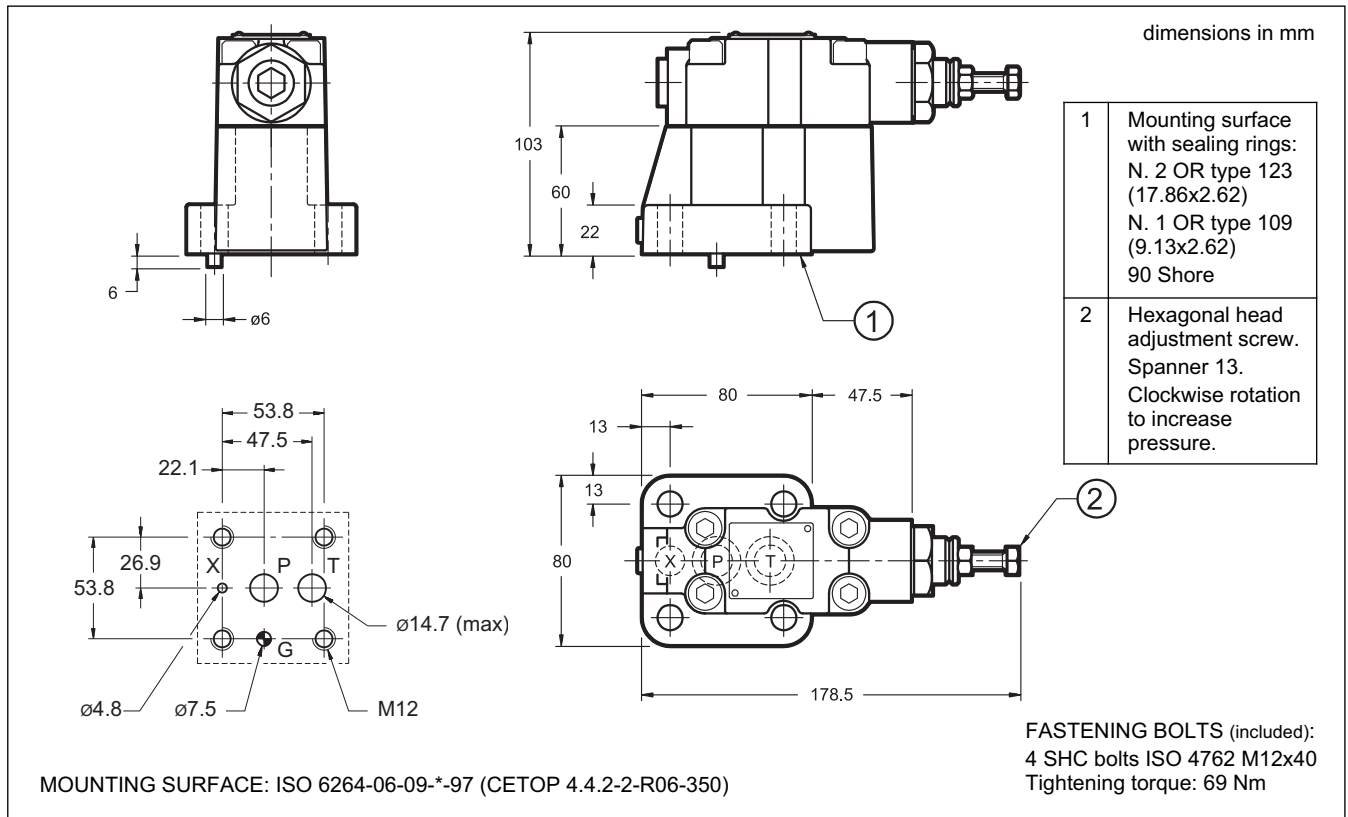


## 3 - HYDRAULIC FLUIDS

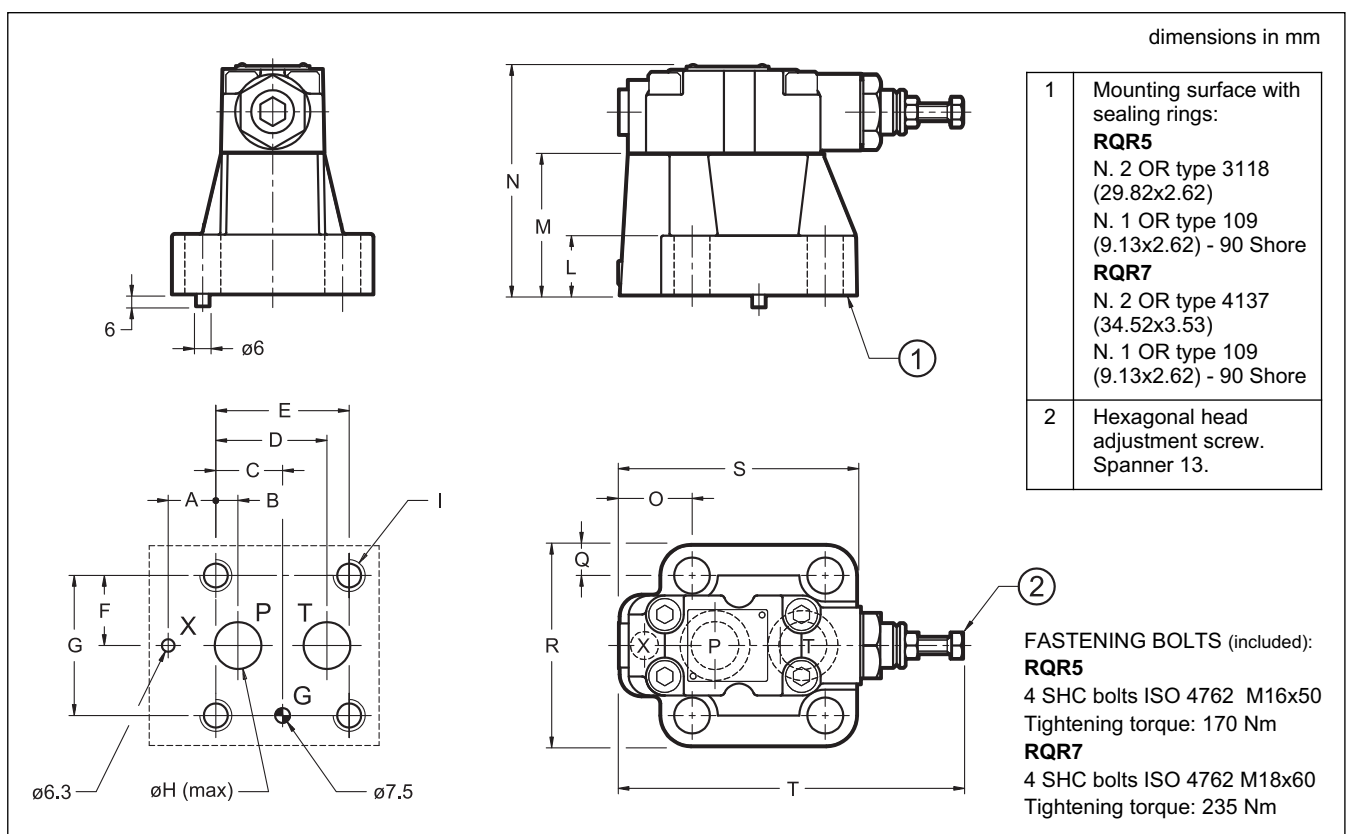
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

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

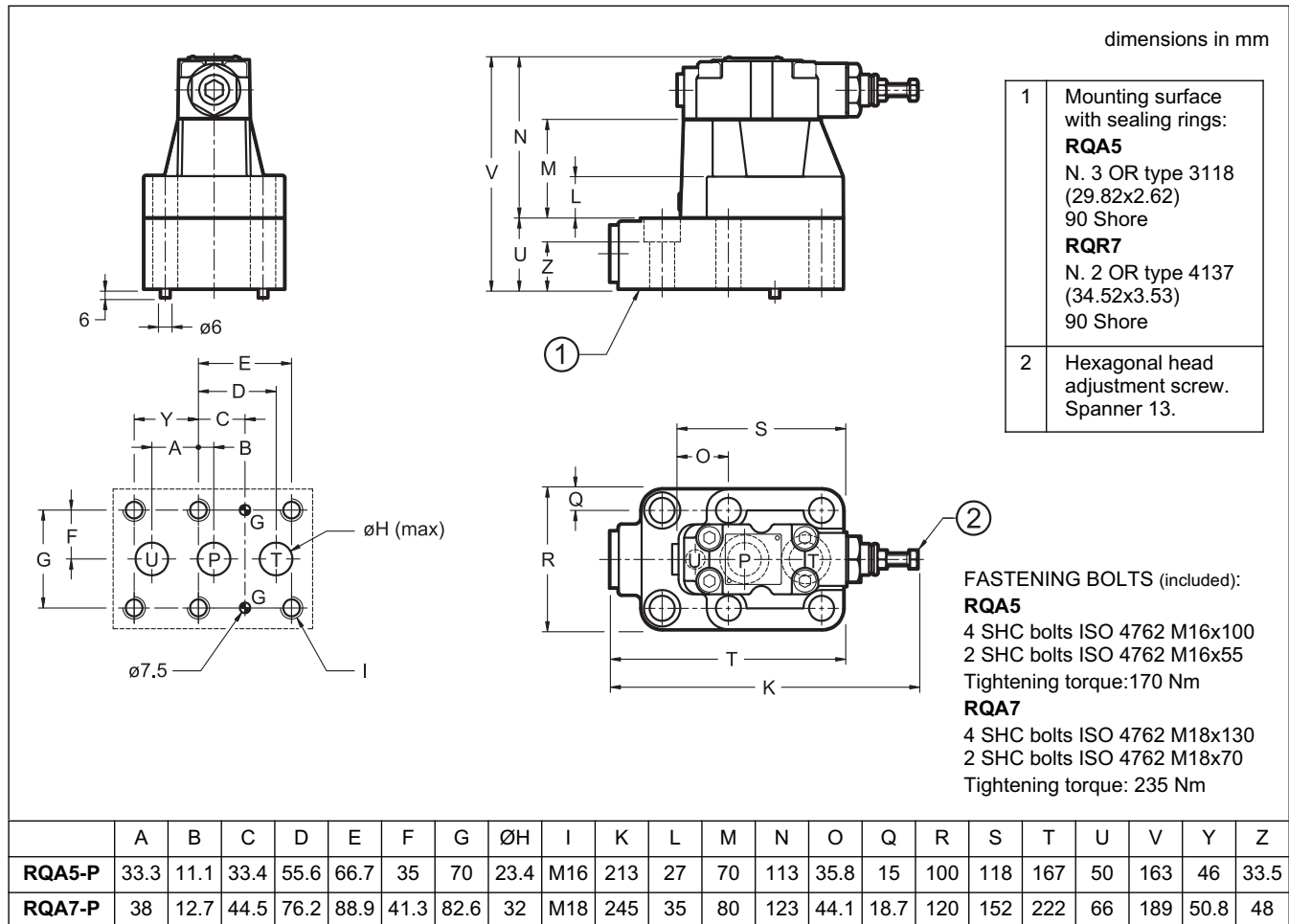


### 5 - RQR5-P AND RQR7-P OVERALL AND MOUNTING DIMENSIONS



	MOUNTING SURFACE	A	B	C	D	E	F	G	ØH	I	L	M	N	O	Q	R	S	T
<b>RQR5-P</b>	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
<b>RQR7-P</b>	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

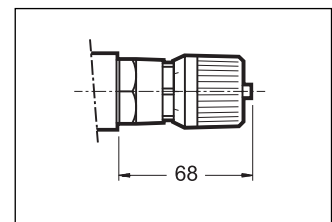
### 6 - RQA5-P AND RQA7P OVERALL AND MOUNTING DIMENSIONS



### 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)

	<b>RQR3-P</b>	<b>RQR5-P</b>	<b>RQR7-P</b>	<b>RQA5-P</b>	<b>RQA7-P</b>
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	-	-

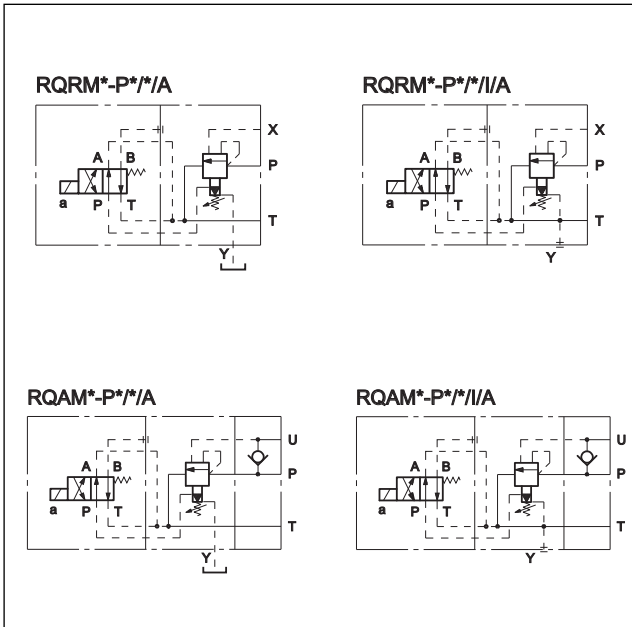




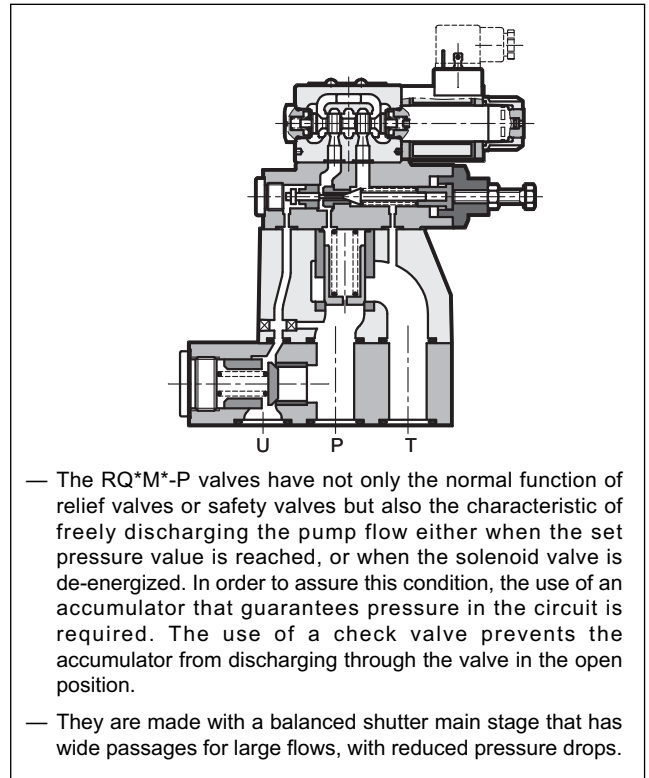
**RQ\*M\*-P**  
UNLOADING VALVE  
WITH AUTOMATIC OR  
SOLENOID OPERATED VENTING  
(FOR CIRCUITS WITH ACCUMULATOR)  
SERIES 51  
**RQRM\*-P**  
FOR REMOTE PILOTING  
**RQAM\*-P**  
WITH INCORPORATED CHECK VALVE

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

<b>R</b>	<b>Q</b>	<b>M</b>	<b>-</b>	<b>P</b>	<b>/</b>	<b>/</b>	<b>A</b>	<b>/</b>	<b>/</b>	<b>/</b>	<b>51</b>	<b>-</b>	<b>K1</b>	<b>/</b>	
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	-----------	----------	-----------	----------	--

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

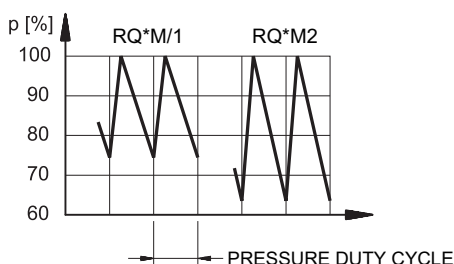
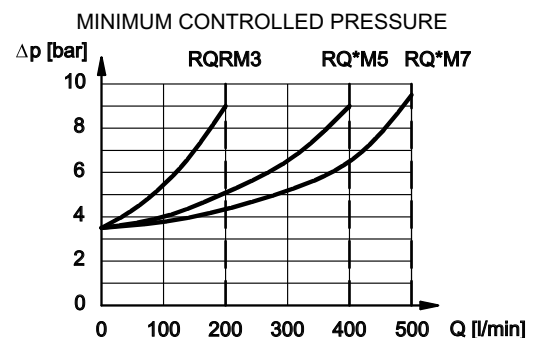
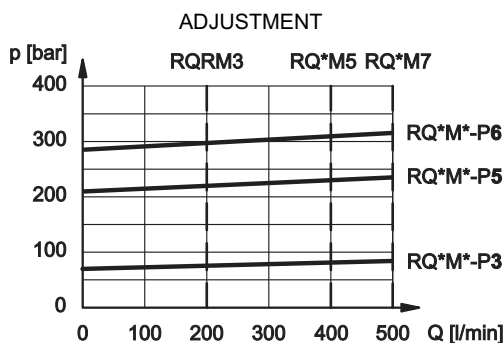
Series No. (the overall and mounting dimensions remain unchanged from 50 to 59)

**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)



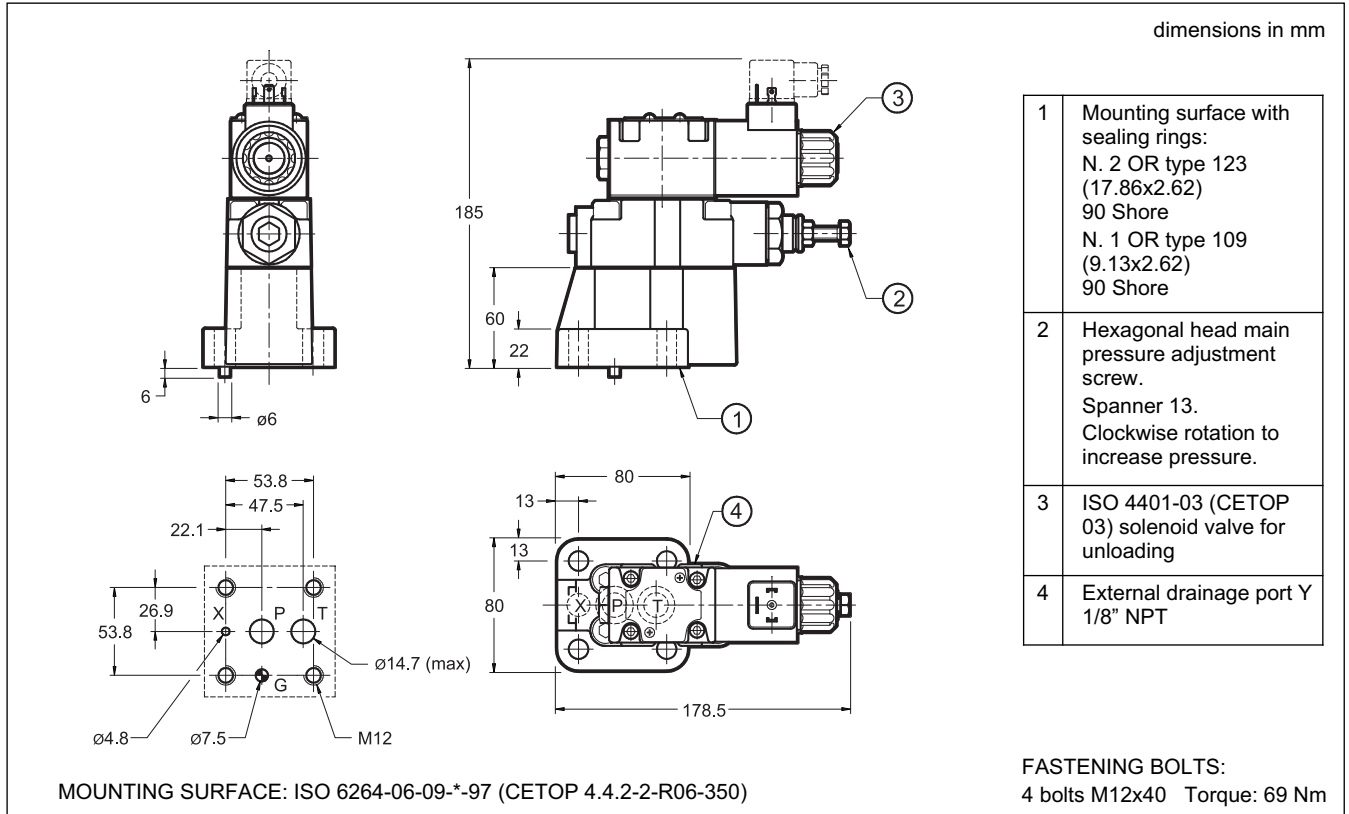
### 3 - HYDRAULIC FLUIDS

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.

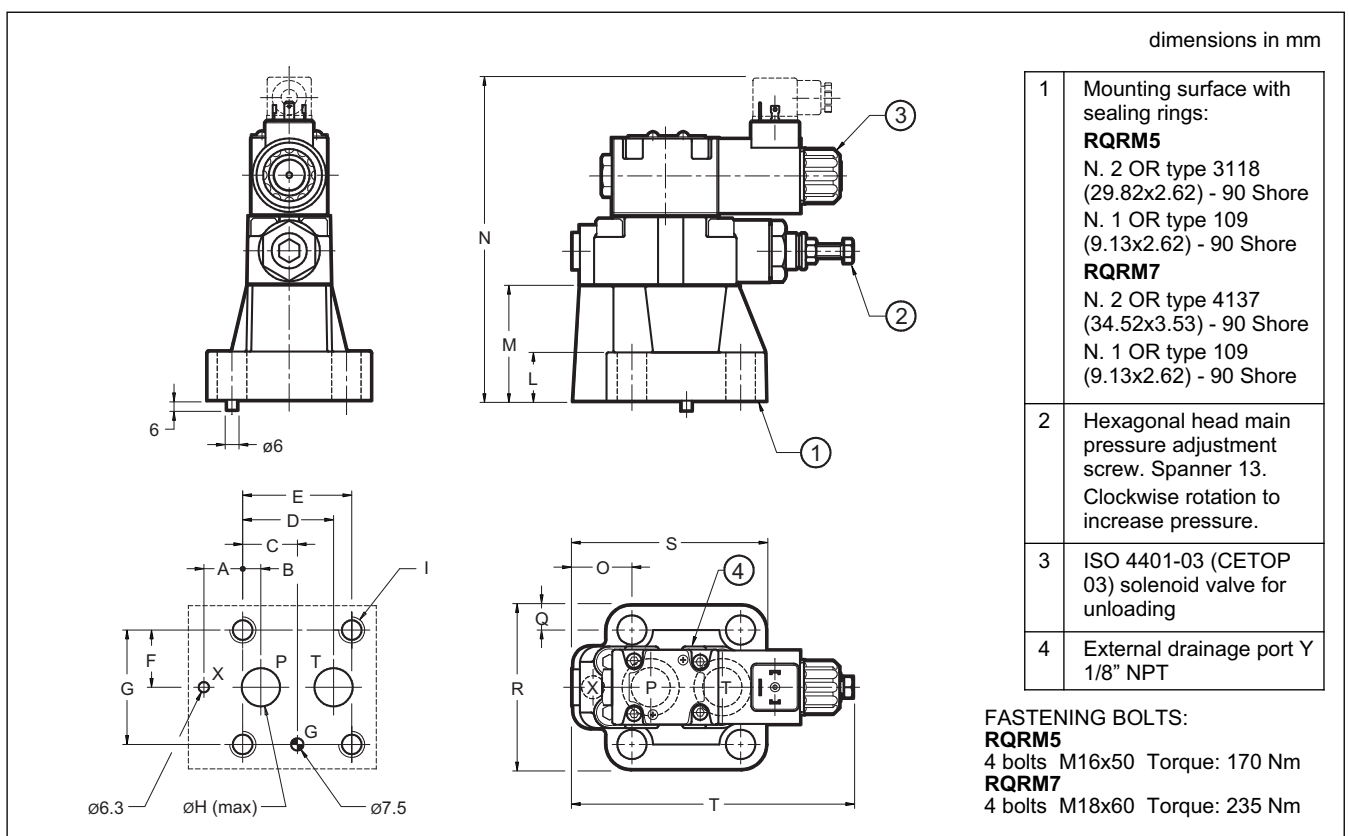
Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

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

### 4 - RQRM3-P OVERALL AND MOUNTING DIMENSIONS

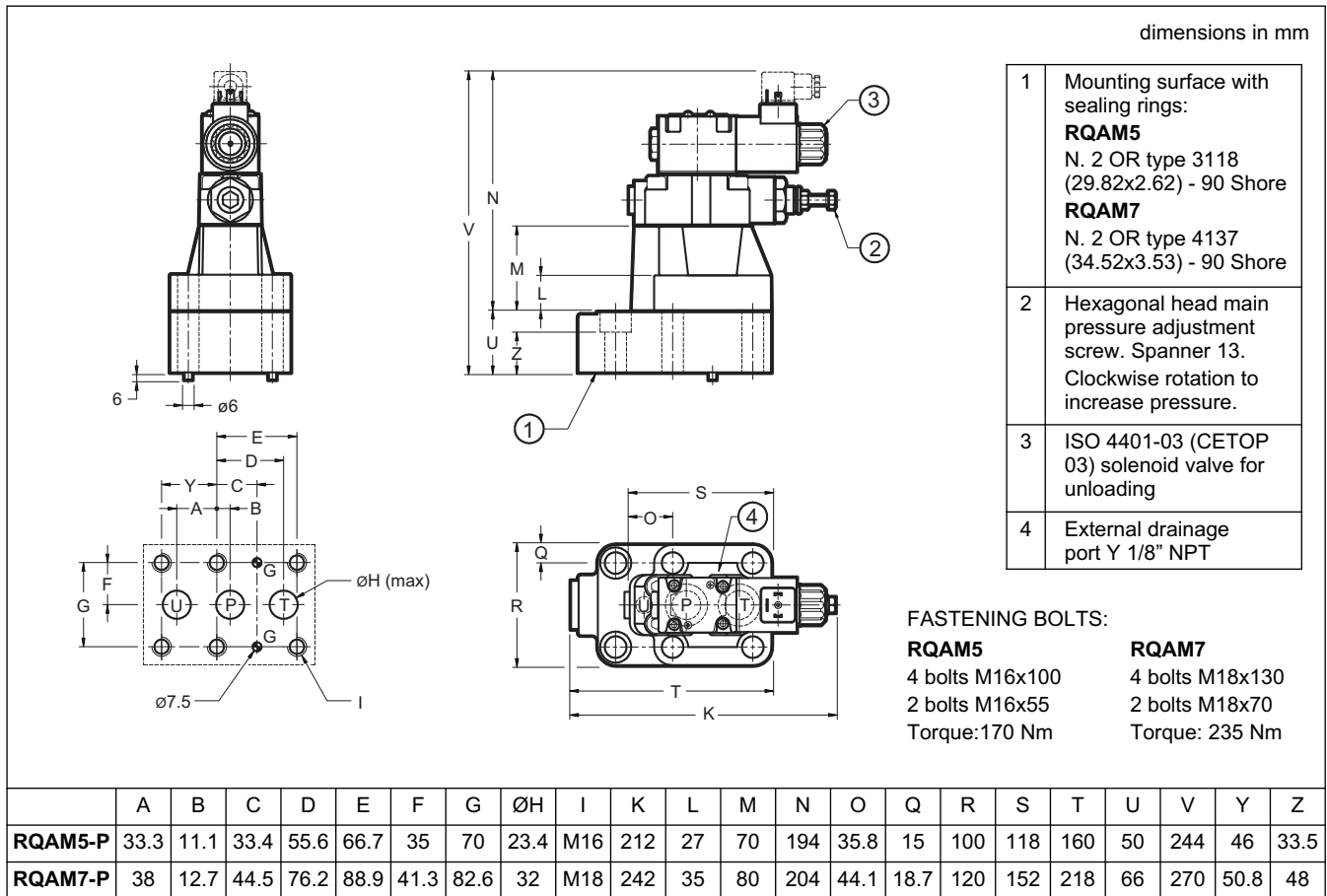


### 5 - RQRM5-P AND RQRM7-P OVERALL AND MOUNTING DIMENSIONS



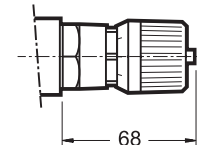
MOUNTING SURFACE		A	B	C	D	E	F	G	ØH	I	L	M	N	O	Q	R	S	T
<b>RQRM5-P</b>	ISO 6264-08-13-*-97 (CETOP 4.4.2-2-R08-350)	23.8	11.1	33.4	55.6	66.7	35	70	23.4	M16	27	70	194	35.8	15	100	118	170
<b>RQRM7-P</b>	ISO 6264-10-17-*-97 (CETOP 4.4.2-2-R10-350)	31.8	12.7	44.5	76.2	88.9	41.3	82.6	32	M18	35	80	204	44.1	18.7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

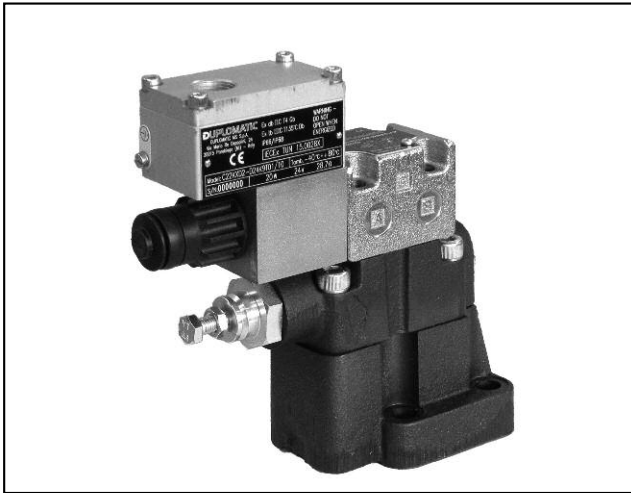
Whenever the solenoid valve installation may involve exposure to atmospheric agents or utilization in tropical climates, use of the manual override, boot protected is recommended. Add the suffix **CM** to request this device (see paragraph 1).

For overall dimensions see catalogue 41 150.

### 10 - SUBPLATES

(see catalogue 51 000)

	<b>RQRM3-P</b>	<b>RQRM5-P</b>	<b>RQRM7-P</b>	<b>RQAM5-P</b>	<b>RQAM7-P</b>
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

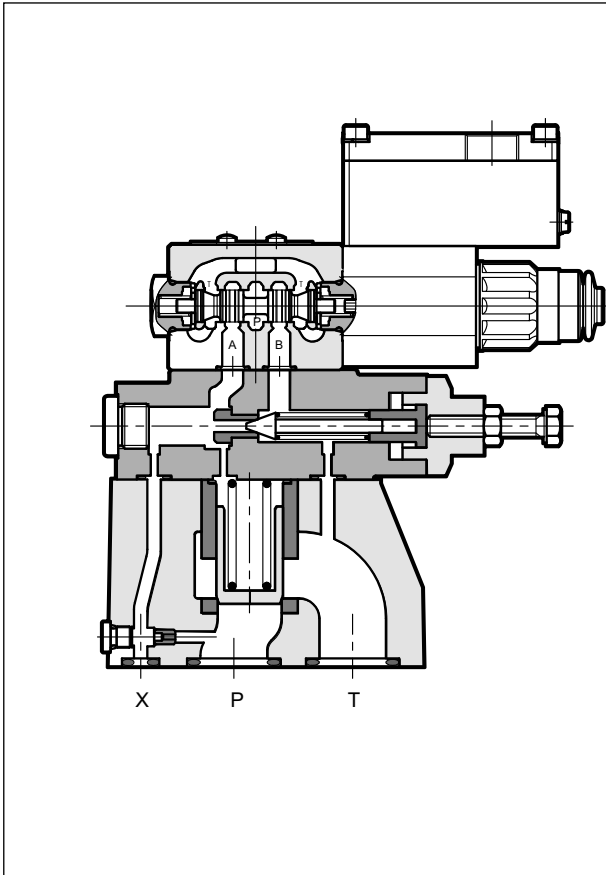
### SUBPLATE MOUNTING

**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

<b>R</b>	<b>Q</b>	<b>M</b>		<b>- P</b>	/	/	/ 10	-	<b>K9</b>	/			
----------	----------	----------	--	------------	---	---	------	---	-----------	---	--	--	--

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.

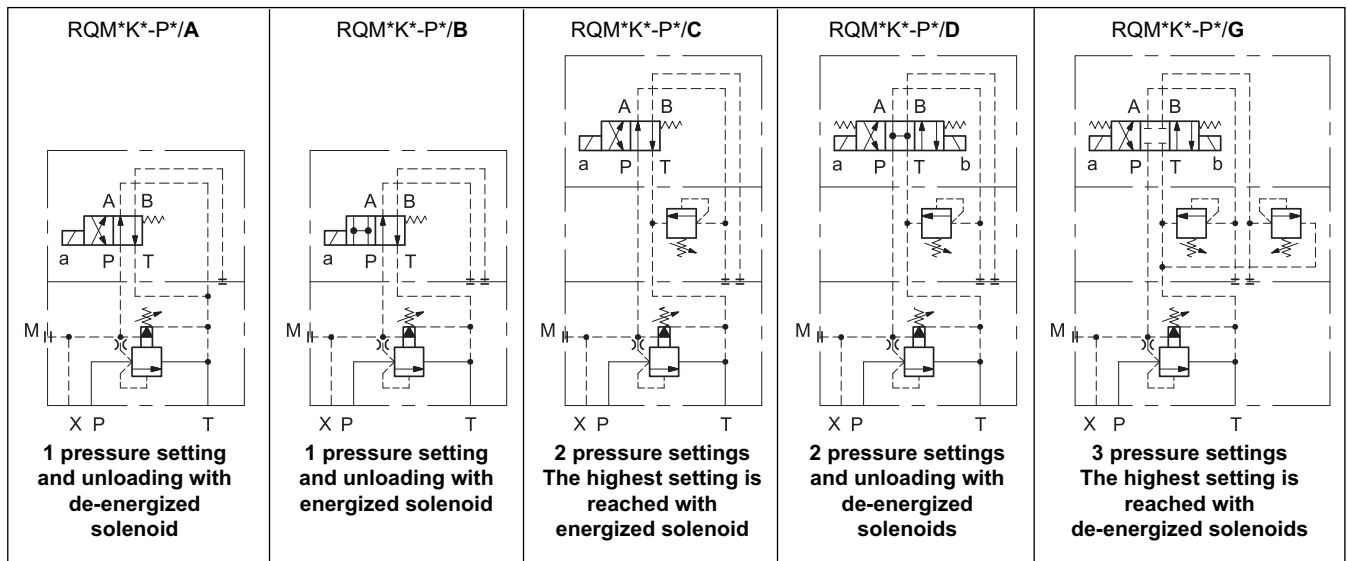
**NOTE:** Valves are supplied with standard surface treatment of phosphating black for the main body and zinc-nickel for the pilot body.  
Upon request we can supply these valves with full zinc-nickel surface treatment, suitable to ensure a salt spray resistance up to 600 h (test operated according to 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	<b>KD2</b>	II 2GD	<b>KXD2</b>	IECEX Gb IECEX Db	<b>KBD2</b>	INMETRO Gb INMETRO Db
for mines	<b>KDM2</b>	I M2	<b>KXDM2</b>	IECEX Mb	<b>KBDM2</b>	INMETRO Mb

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

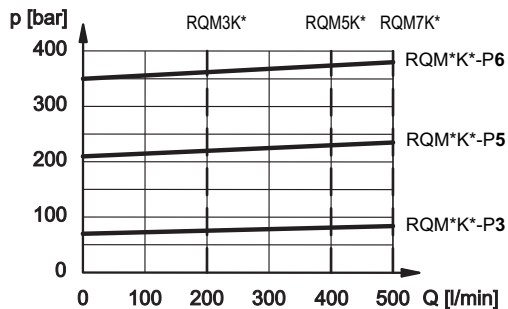
### 2 - VERSIONS



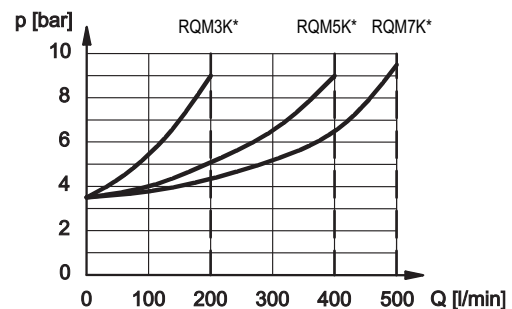
### 3 - CHARACTERISTIC CURVES

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

ADJUSTMENT



MINIMUM CONTROLLED PRESSURE





## 4 - ELECTRICAL CHARACTERISTICS

(values  $\pm 5\%$ )

Coil type	Nominal voltage [V]	Resistance at 20°C [ $\Omega$ ]	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 [ $\Omega$ ]	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

<b>VOLTAGE SUPPLY FLUCTUATION (ripple included)</b>	$\pm 10\%$ Vnom
<b>MAX SWITCH ON FREQUENCY</b>	6.000 ins/hour
<b>DUTY CYCLE</b>	100%
<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b>	According to 2014/30/EU
<b>CLASS OF PROTECTION:</b> 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.

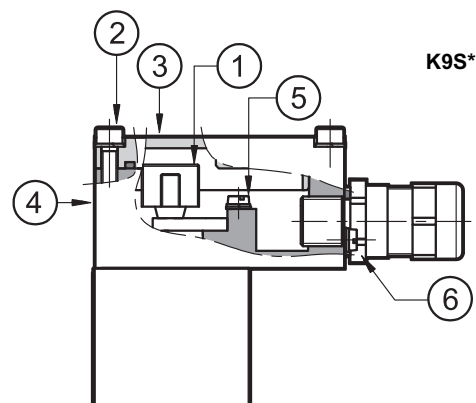
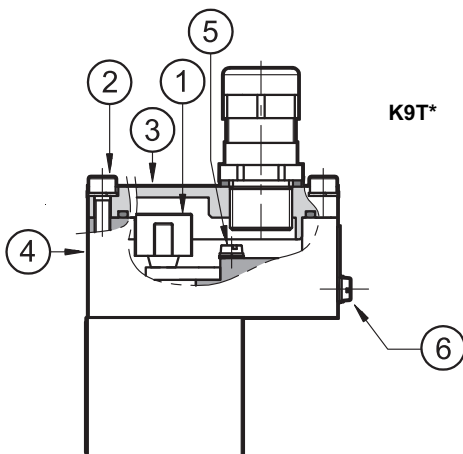
**The electrical connection is polarity-independent.**

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  $\Omega$ ), 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.





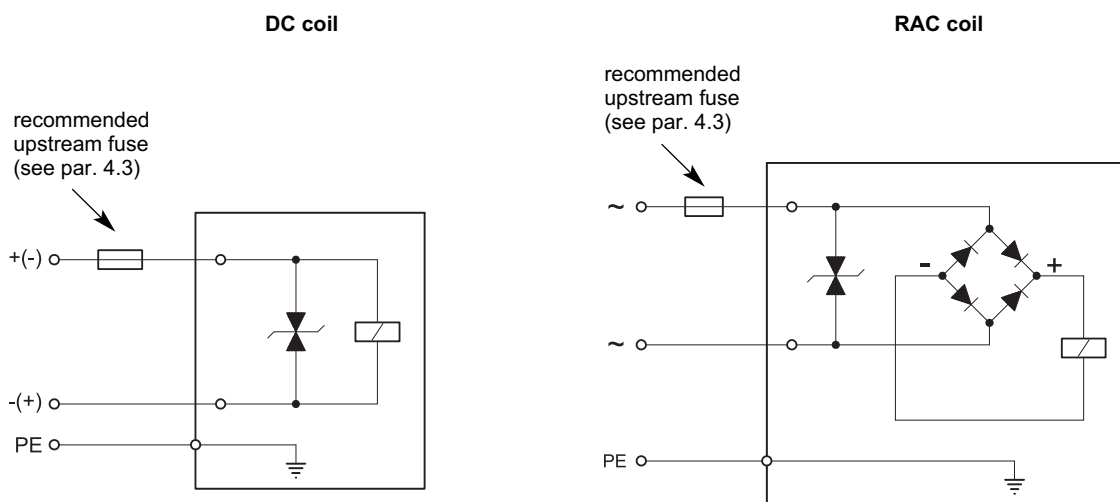
Characteristics of the cables connectable for wiring are indicated in the table below:

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

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<sub>n</sub> 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.

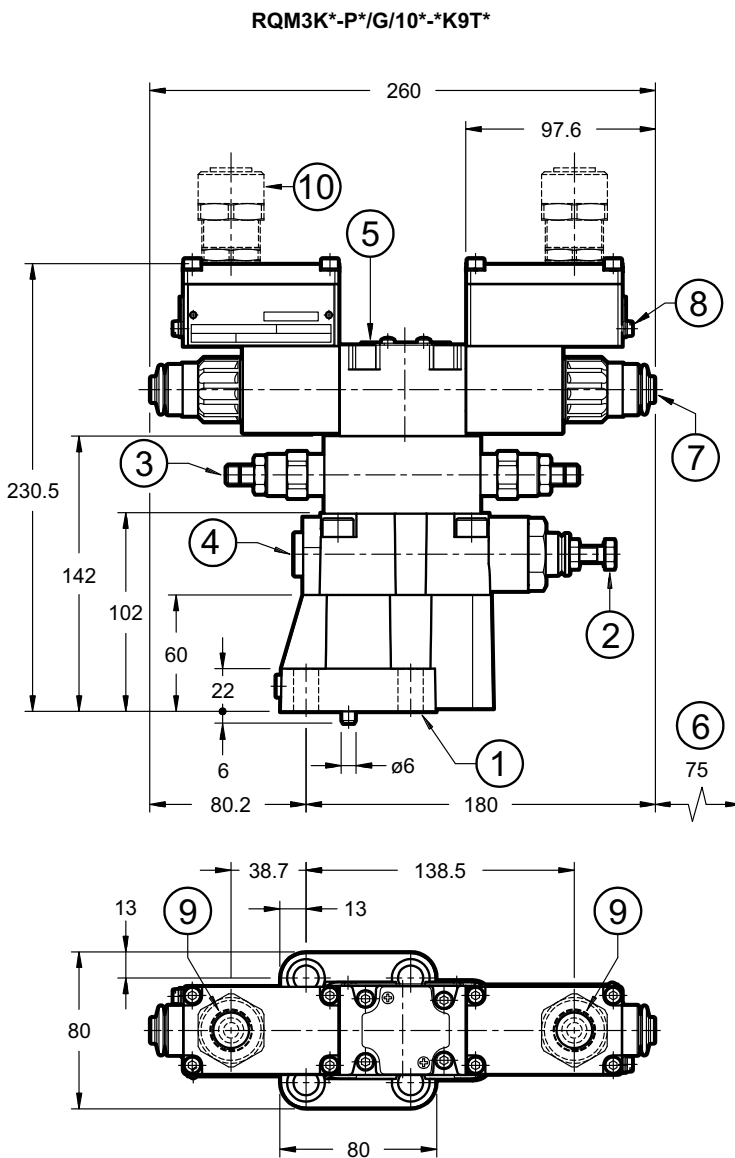
In order to safeguard the electronic device to which the valve is connected, there is a protection circuit in the coil, that reduces voltage peaks, which can occur when inductances are switched off.

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
<b>D12</b>	12	1,7	2,5	- 49	Transient voltage suppressor bidirectional
<b>D24</b>	24	0,83	1,25	- 49	
<b>D48</b>	48	0,42	0,6	- 81	
<b>D110</b>	110	0,2	0,3	- 309	
<b>R120</b>	120	0,21	0,3	- 3	
<b>R240</b>	240	0,1	0,15	- 3	

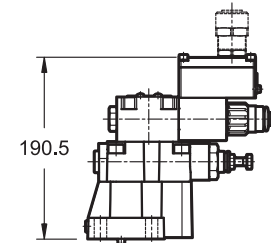
## 5 - RQM3K\*-P WITH UPPER CONNECTION - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

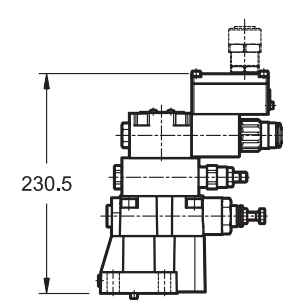


RQM3K\*-P\*/A/10\*-K9T\*

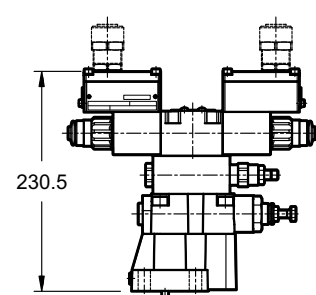
RQM3K\*-P\*/B/10\*-K9T\*



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



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



**NOTE:** for side connection cable gland see paragraph 8.

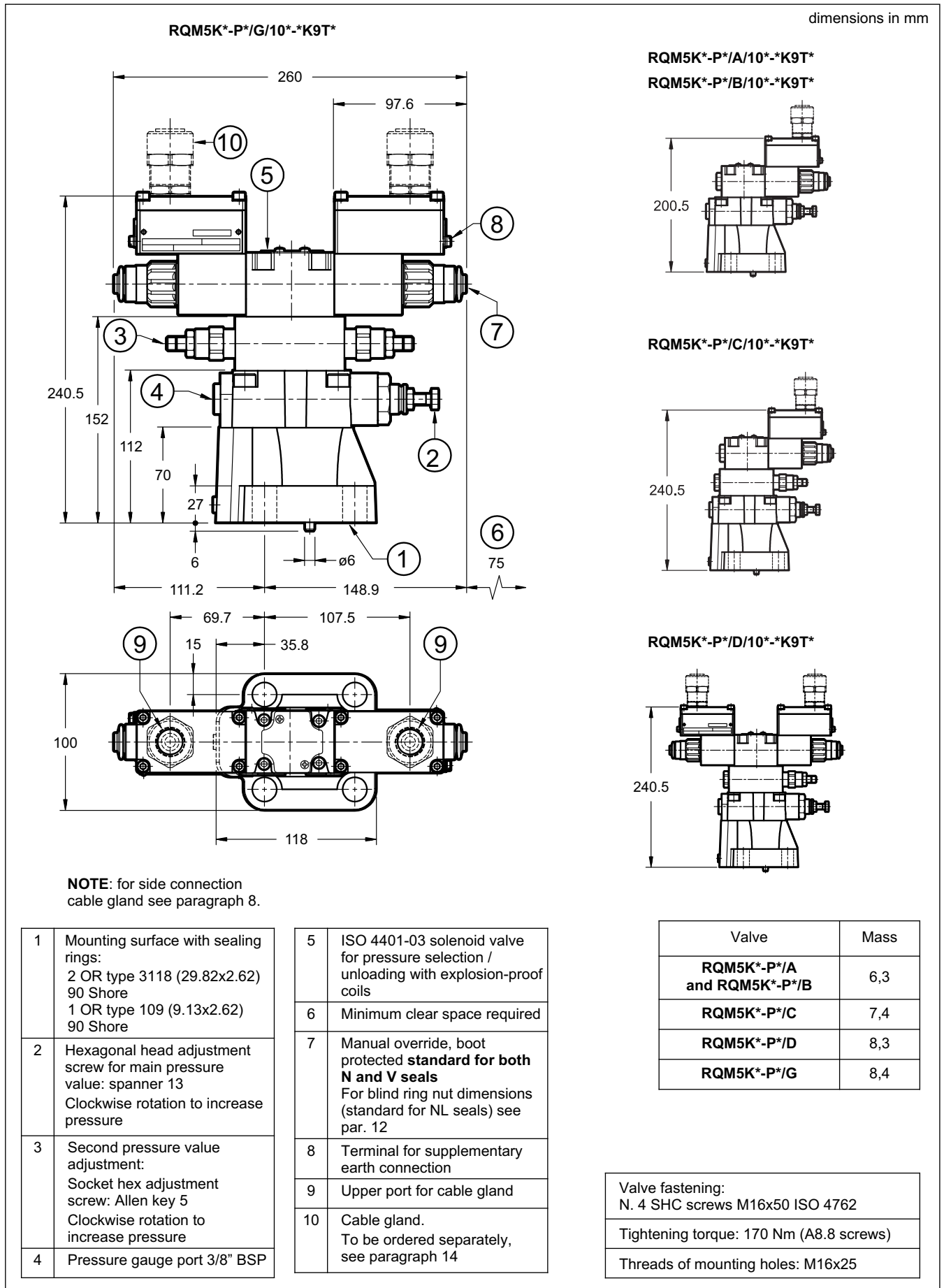
1	Mounting surface with sealing rings: 2 OR type 123 (17.86x2.62) 90 Shore 1 OR type 109 (9.13x2.62) 90 Shore
2	Hexagonal head adjustment screw for main pressure value: spanner 13 Clockwise rotation to increase pressure
3	Second pressure value adjustment: Socket hex adjustment screw: Allen key 5 Clockwise 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 <b>standard for both N and V seals</b> 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

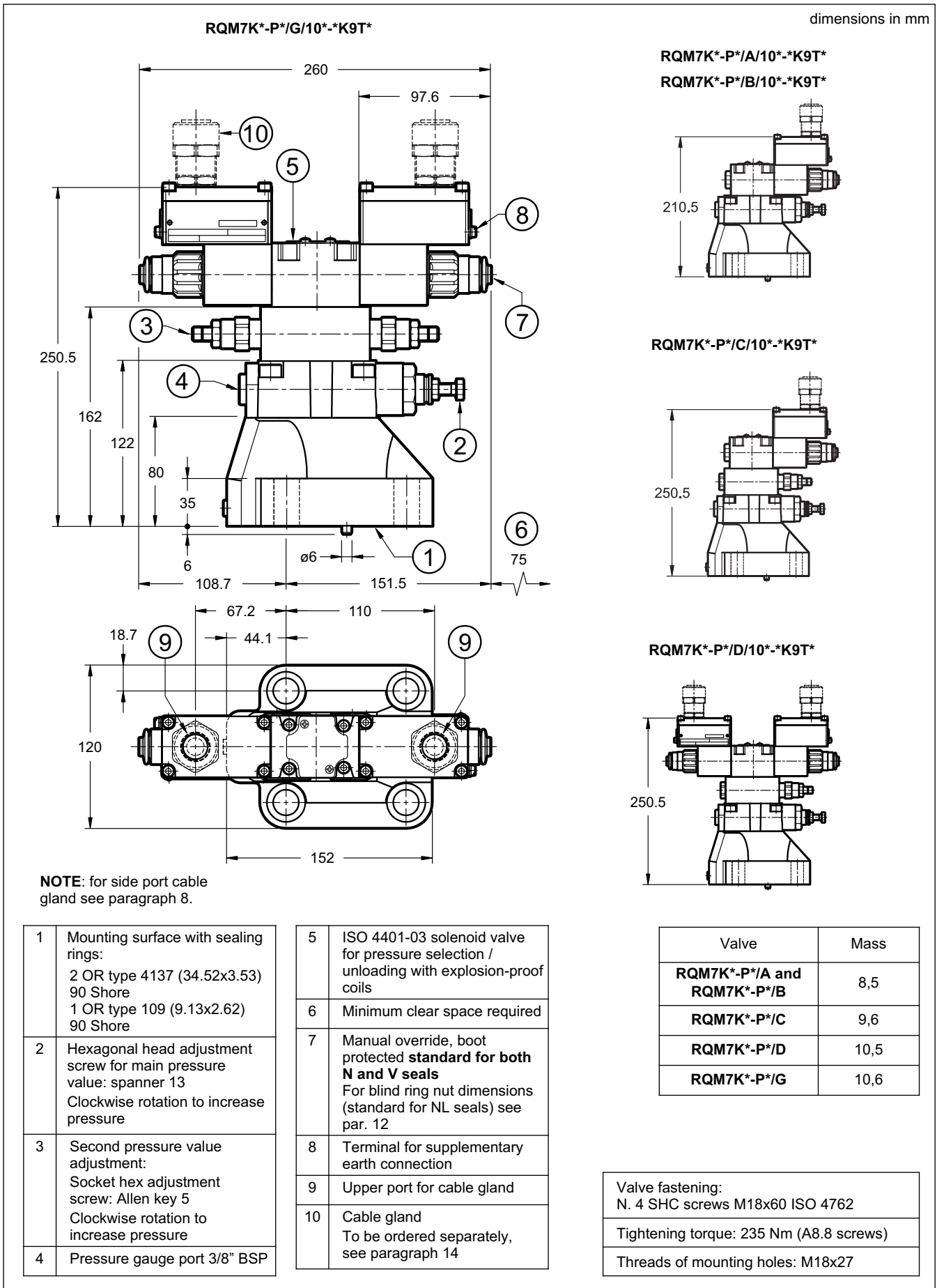
Valve	Mass
RQM3K*-P*/A and RQM3K*-P*/B	5,3
RQM3K*-P*/C	6,4
RQM3K*-P*/D	7,3
RQM3K*-P*/G	7,4

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

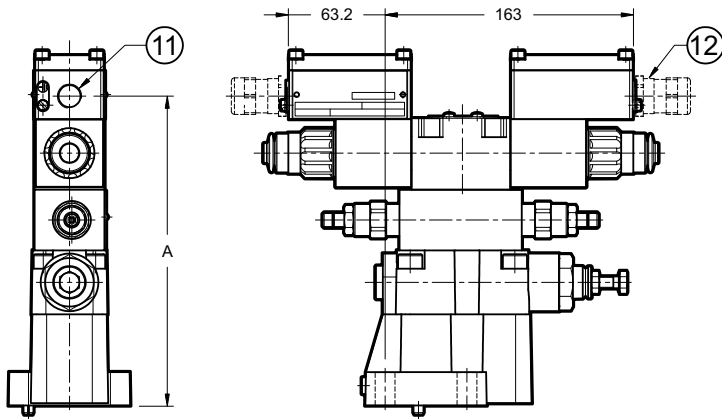


## 7 - RQM7K\*-P WITH UPPER CONNECTION - OVERALL AND MOUNTING DIMENSIONS



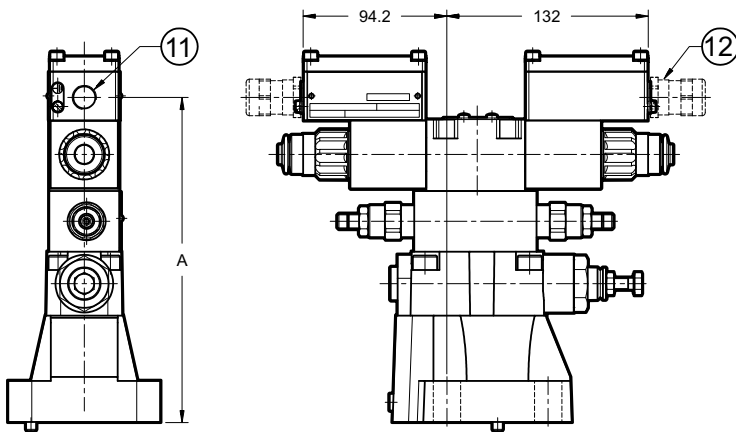
## 8 - RQM\*K\*-P\* SIDE CONNECTION OVERALL AND MOUNTING DIMENSIONS

dimensions in mm



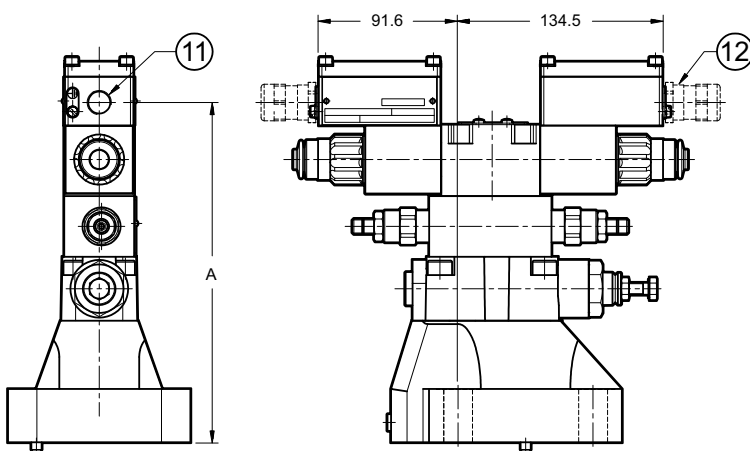
**RQM3K\*-P\*/10\*-K9S\***

Side port type	Dimension A	
	RQM3K*-P*/A RQM3K*-P*/B	RQM3K*-P*/C RQM3K*-P*/D RQM3K*-P*/G
<b>S01, S04</b>	162.5	202.5
<b>S02, S03</b>	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
<b>S01, S04</b>	172.5	212.5
<b>S02, S03</b>	172	212



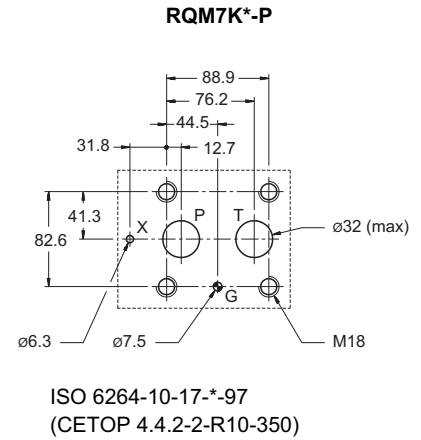
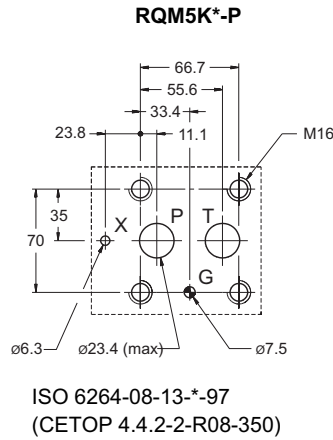
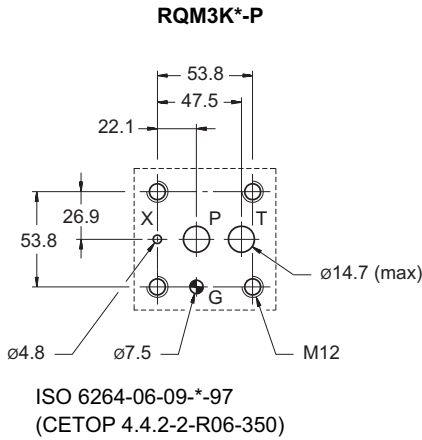
**RQM7K\*-P\*/10\*-K9S\***

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

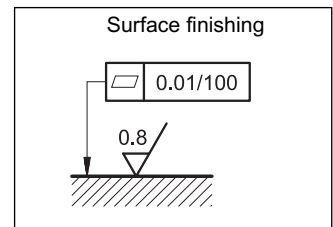


Installation must adhere to instructions reported in the *Use and Maintenance manual*, always supplied with the valve. Unauthorized interventions can be harmful to people and goods because of the explosion hazards present in potentially explosive atmospheres.

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

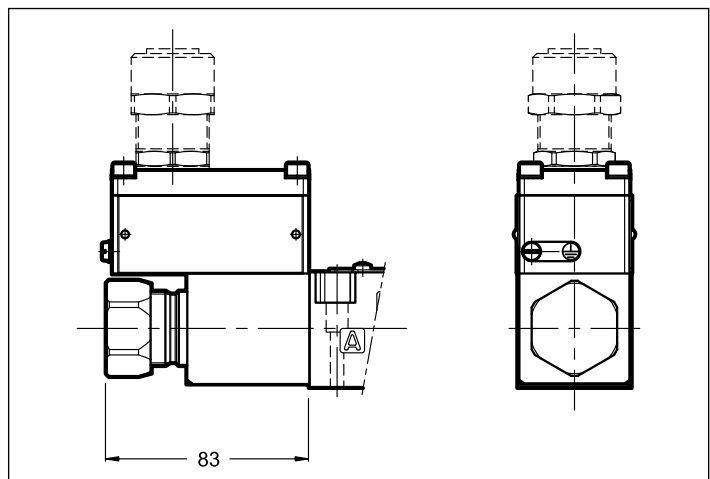
### CB - Blind ring nut

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.

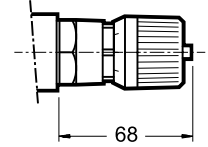




### 13 - ADJUSTMENT KNOB

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.

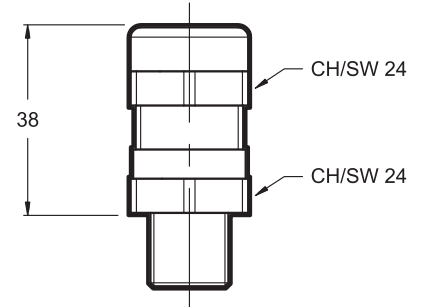
To request this option, add: /M (see paragraph 1).



### 14 - CABLE GLANDS

Cable glands must be ordered separately; Diplomatic 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-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-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-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

<b>RQM*K*-P</b>	<b>21 515</b>
<b>P*E*K*</b>	<b>81 316</b>
<b>ZDE3K*</b>	<b>81 515</b>
<b>DZCE*K*</b>	<b>81 605</b>

flow control valves

<b>QDE*K*</b>	<b>82 225</b>
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directional valves

<b>D*K*</b>	<b>41 515</b>
<b>DT3K*</b>	<b>42 215</b>
<b>DS(P)E*K*</b>	<b>83 510</b>

#### 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:

<b>ATEX</b>	<b>II 2G</b>	<b>II 2D</b>	<b>I M2</b>
<b>IECEX</b>	<b>Gb</b>	<b>Db</b>	<b>Mb</b>
<b>INMETRO</b>	<b>Gb</b>	<b>Db</b>	<b>Mb</b>

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

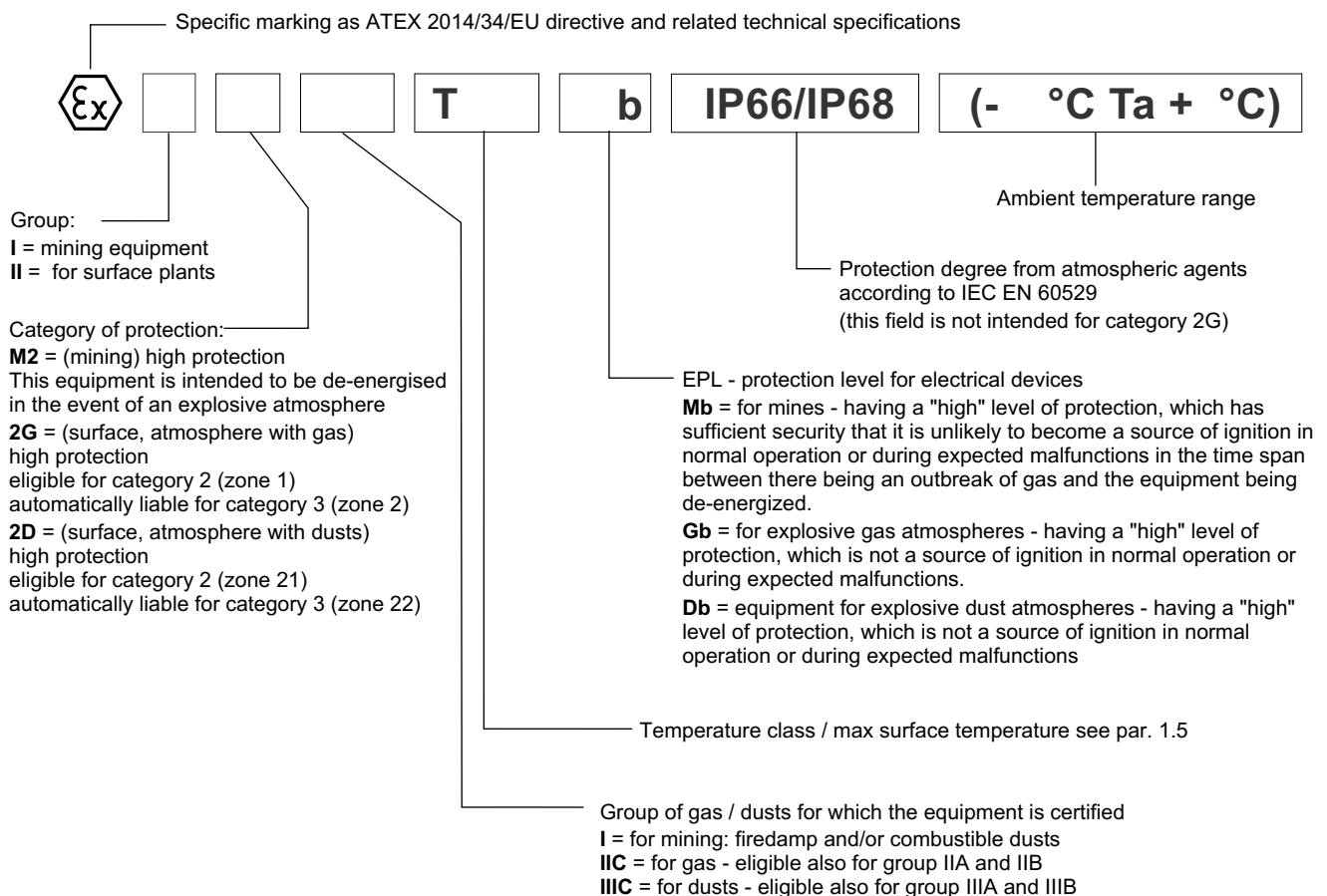
Type examination certificate: AR18ATEX055

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

ATEX II 2G ATEX II 2D	<b>*KD2</b>	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	<b>*KDM2</b>	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
<b>*KD2</b>	for gas	$\text{Ex}$ II 2G IIC T4 Gb (-20°C Ta +80°C)	$\text{Ex}$ II 2G IIC T4 Gb (-40°C Ta +80°C)
	for dusts	$\text{Ex}$ II 2D IIIC T154°C Db IP66/IP68 (-20°C Ta +80°C)	$\text{Ex}$ II 2D IIIC T154°C Db IP66/IP68 (-40°C Ta +80°C)
<b>*KD2 /T5</b>	for gas	$\text{Ex}$ II 2G IIC T5 Gb (-20°C Ta +55°C)	$\text{Ex}$ II 2G IIC T5 Gb (-40°C Ta +55°C)
	for dusts	$\text{Ex}$ II 2D IIIC T129°C Db IP66/IP68 (-20°C Ta +55°C)	$\text{Ex}$ II 2D IIIC T129°C Db IP66/IP68 (-40°C Ta +55°C)
<b>*KDM2</b>	mining	$\text{Ex}$ I M2 I T150°C Mb IP66/68 (-20°C Ta +75°C)	$\text{Ex}$ I M2 I T150°C Mb IP66/68 (-40°C Ta +75°C)










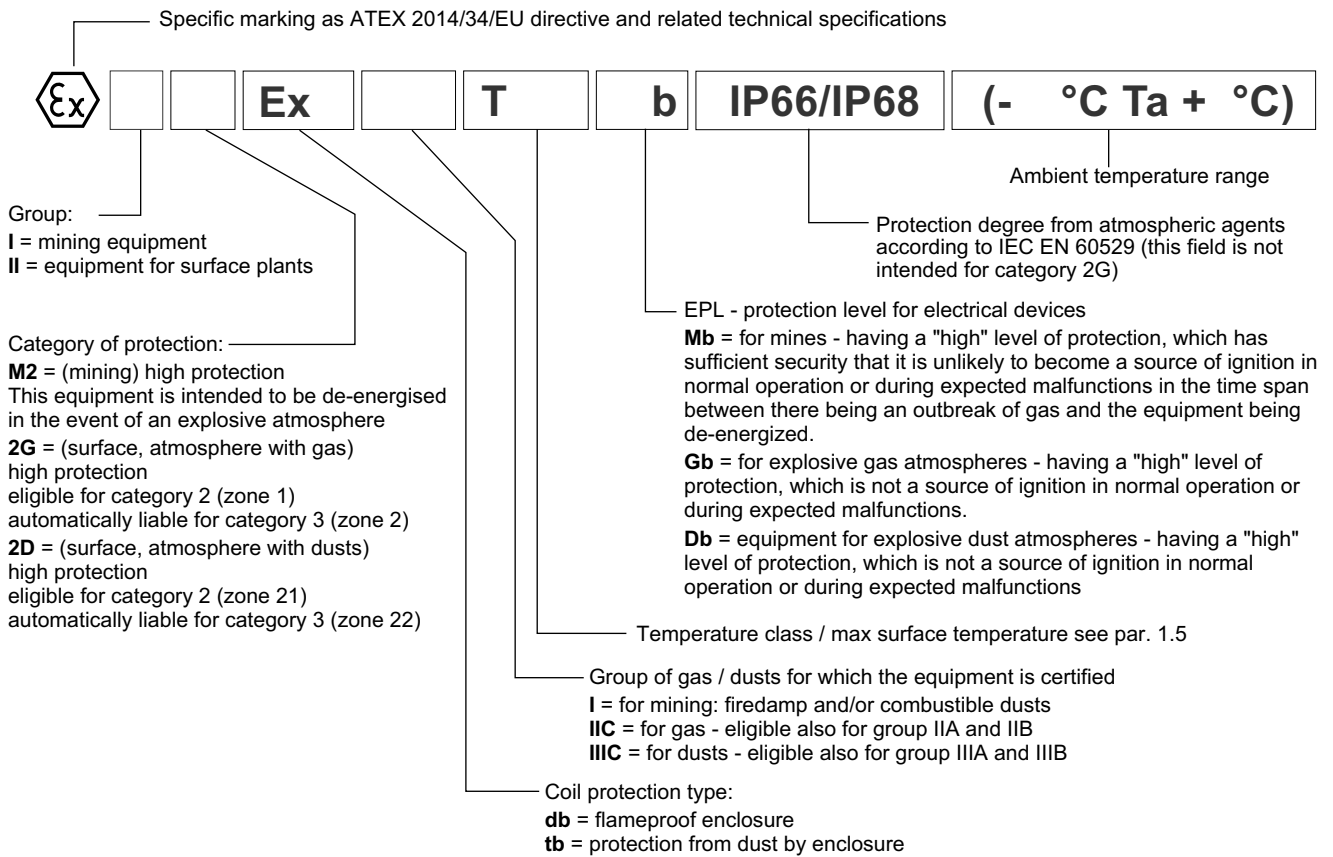
### 1.3 - ATEX classification of the coils

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 <b>*KD2</b>	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 <b>*KD2 /T5</b>	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 <b>*KDM2</b>	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	<b>*KD2</b>	of ambient	-20 / +80 °C	-40 / +80 °C	T4 (gas) T154°C (dusts)	T3, T2, T1 T200°C and higher
		of fluid				
	<b>*KD2 /T5</b>	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	<b>*KDM2</b>	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

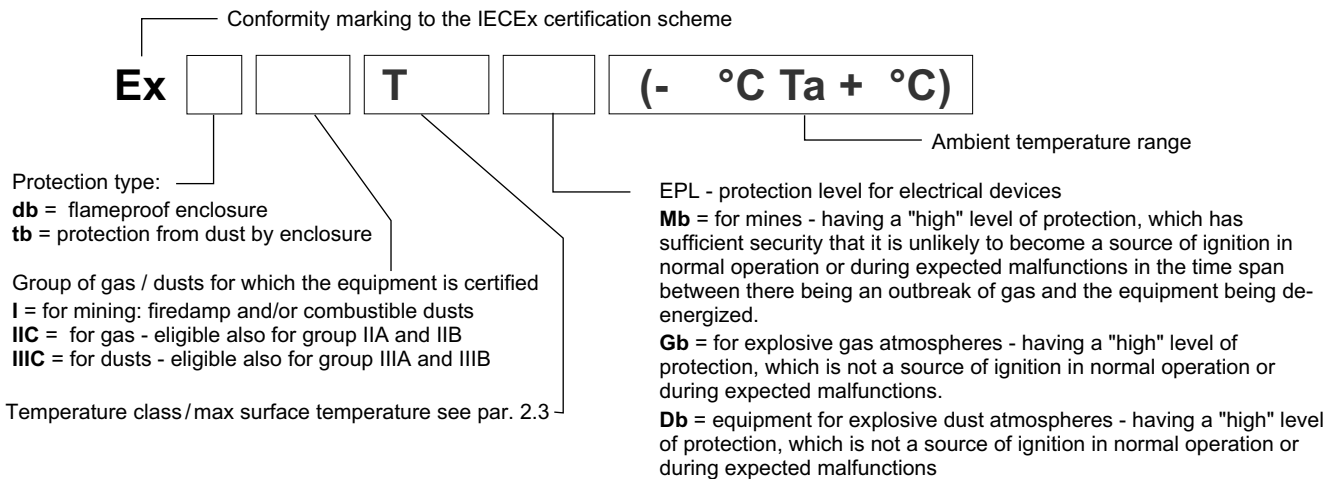
The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

IECEx Gb IECEx Db	<b>*KXD2</b>	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	<b>*KXDM2</b>	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.

<b>*KXD2</b> 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)
<b>*KXD2 /T5</b> 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)
<b>*KDM2</b> 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	<b>*KXD2</b>	of ambient	-20 / +80 °C	-40 / +80 °C	T4 (gas) T135°C (dusts)	T3, T2, T1 T200°C and higher
		of fluid				
IECEx Db	<b>*KXD2 /T5</b>	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	<b>*KXDM2</b>	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

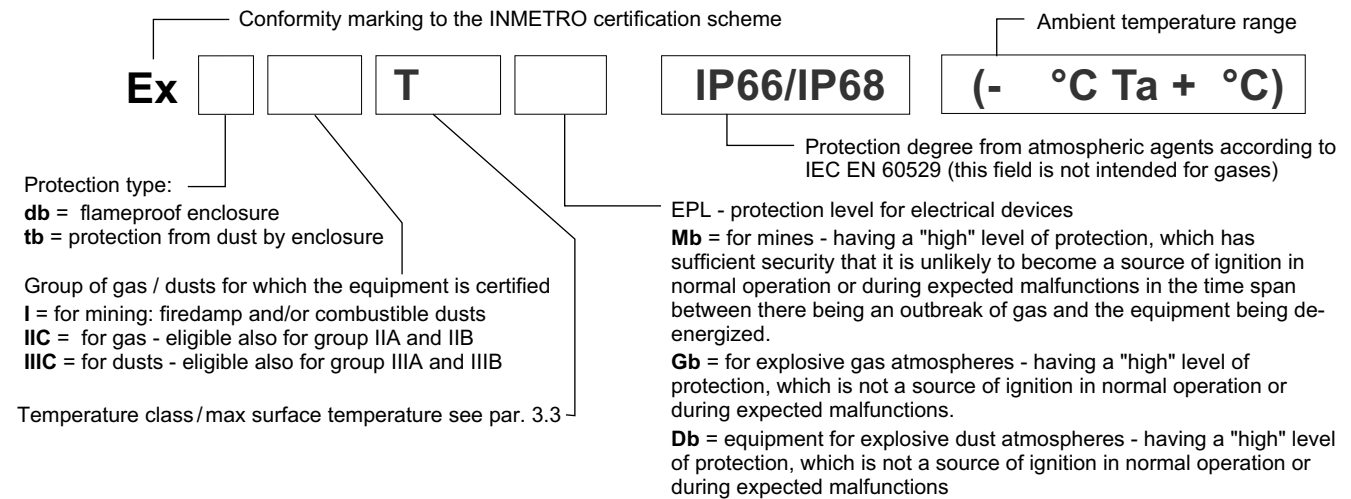
The valves are suitable for applications and installations in potentially explosive atmospheres that fall within:

INMETRO Gb INMETRO Db	<b>*KBD2</b>	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	<b>*KBDM2</b>	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.

<b>*KBD2</b> 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)
<b>*KBD2 /T5</b> 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)
<b>*KBDM2</b> 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	<b>*KBD2</b>	of ambient	-20 / +80 °C	-40 / +80 °C	T4 (gas) T154°C (dusts)	T3, T2, T1 T200°C and higher
		of fluid				
INMETRO Db	<b>*KBD2 /T5</b>	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	<b>*KBDM2</b>	of ambient	-20 / +75 °C	-40 / +75 °C	T150°C	-
		of fluid				



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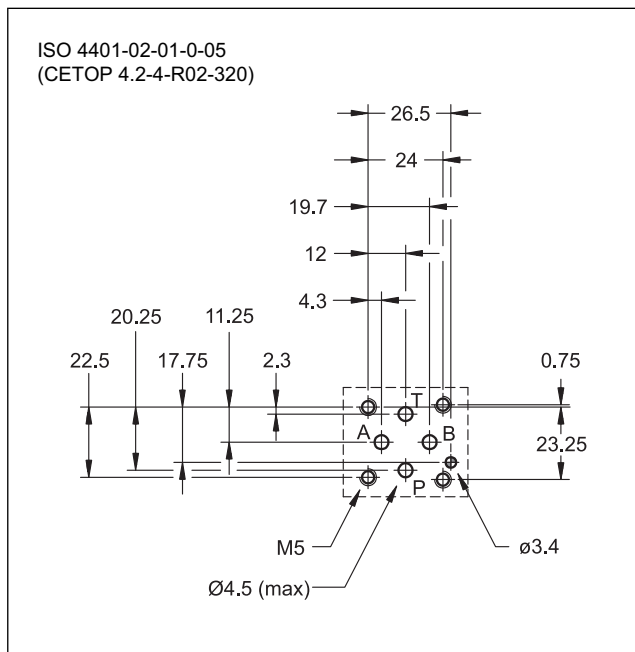
# PRM2

## DIRECT OPERATED PRESSURE RELIEF VALVE SERIES 10

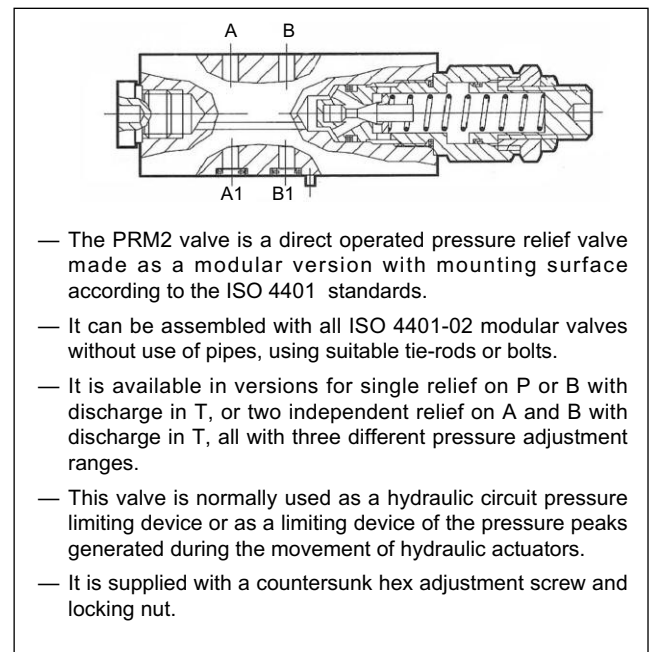
### MODULAR VERSION ISO 4401-02

**p** max 320 bar  
**Q** max 20 l/min

### MOUNTING SURFACE



### OPERATING PRINCIPLE

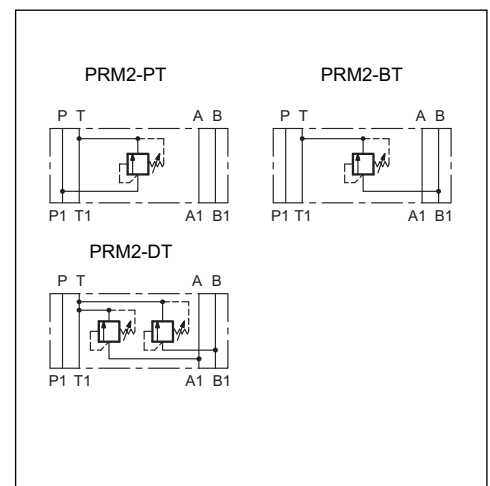


### PERFORMANCES

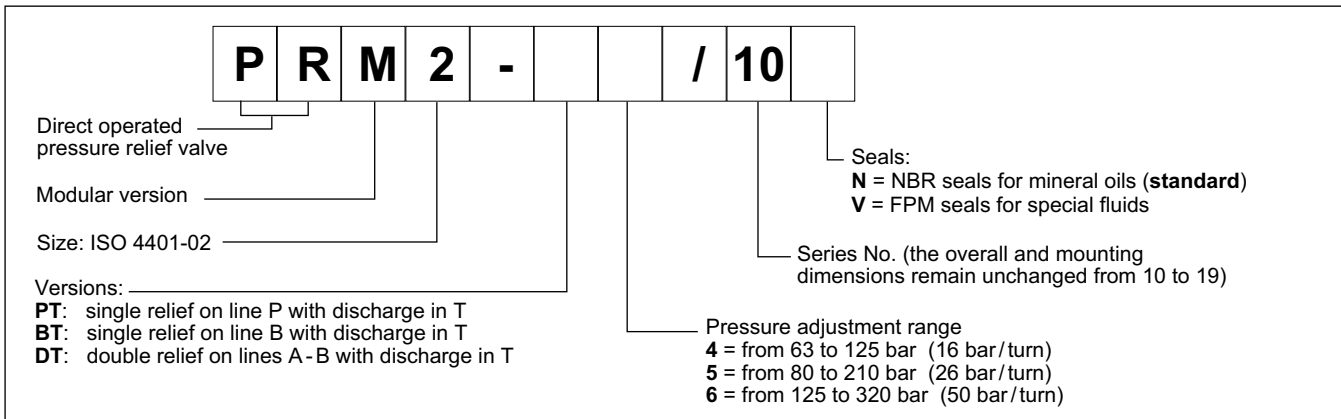
(measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	320
Minimum controlled pressure	see $\Delta p$ 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

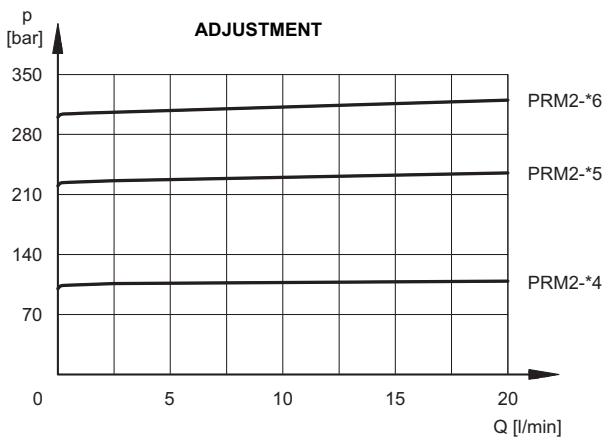


### 1 - IDENTIFICATION CODE



### 2 - CHARACTERISTIC CURVES

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



### 3 - HYDRAULIC FLUIDS

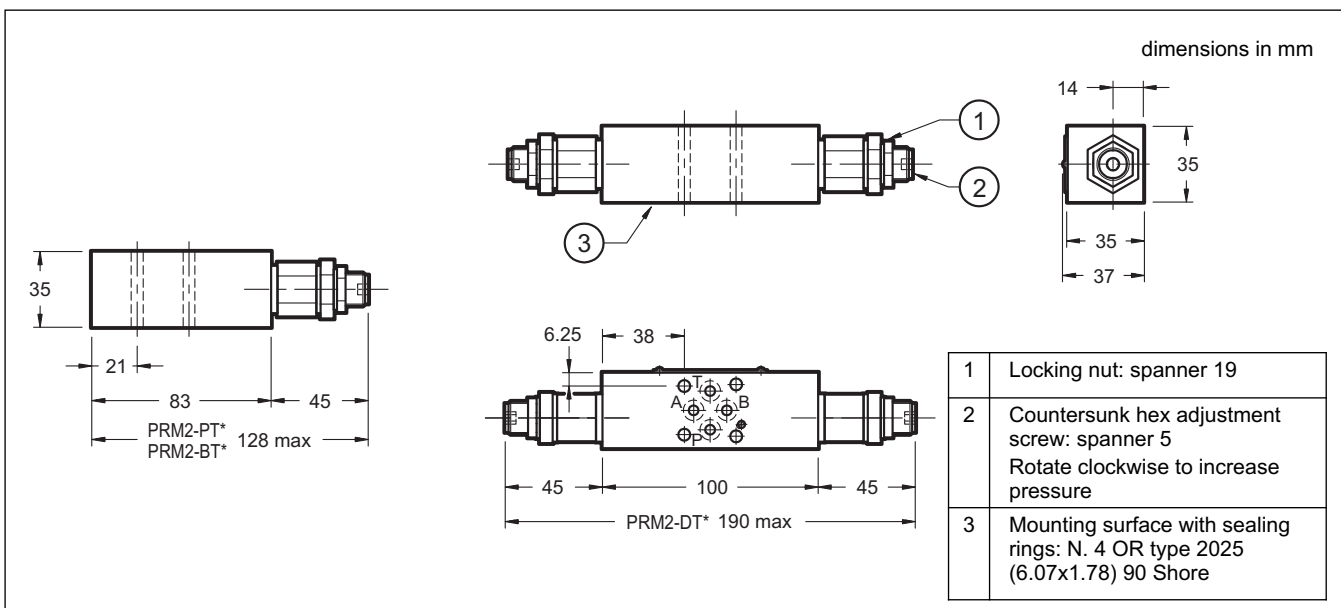
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V).

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

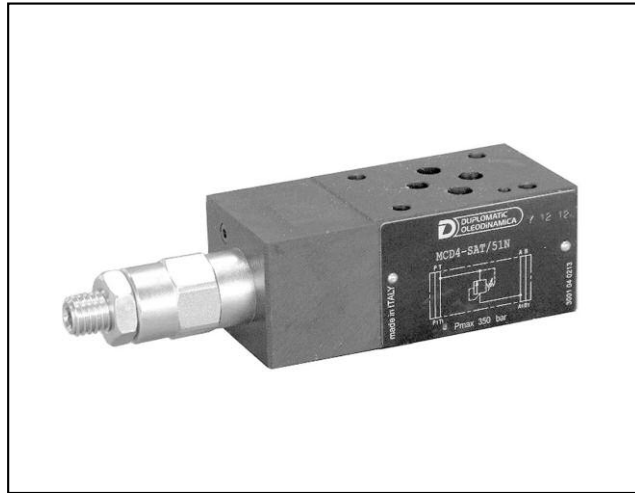
Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

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

### 4 - OVERALL AND MOUNTING DIMENSIONS







# MCD

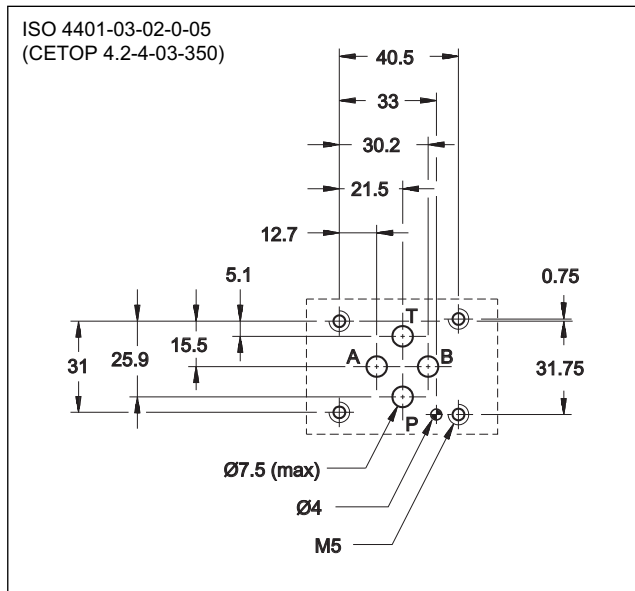
## DIRECT OPERATED PRESSURE RELIEF VALVE

### SERIES 51

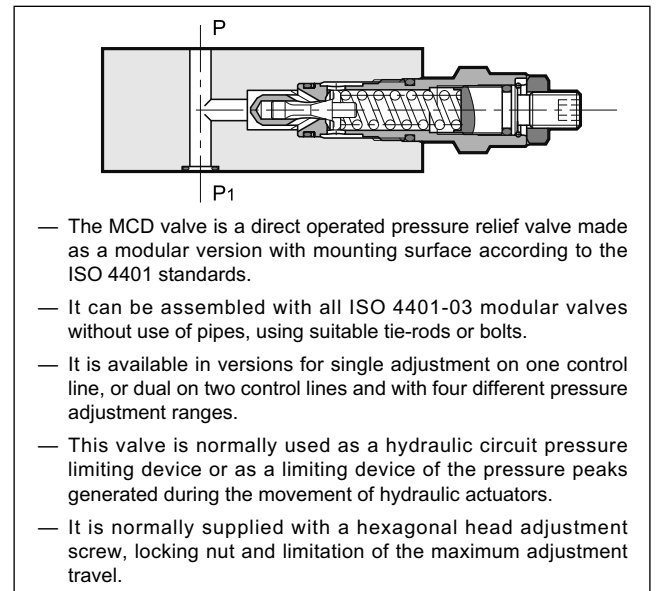
#### MODULAR VERSION ISO 4401-03

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

#### MOUNTING INTERFACE



#### OPERATING PRINCIPLE



#### CONFIGURATIONS (see hydraulic symbols table)

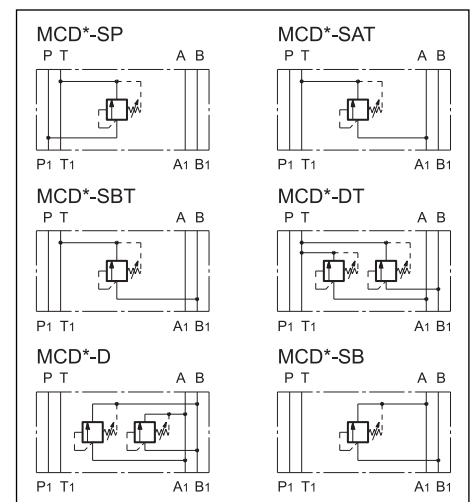
- “SP”: controls the pressure on line P with discharge in T
- “SAT”: controls the pressure on line A with discharge in T
- “SBT”: controls the pressure on line B with discharge in T

- “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 $\Delta p$ 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

<b>M</b>	<b>C</b>	<b>D</b>	<b>-</b>	<b>/ 51</b>	<b>/</b>
----------	----------	----------	----------	-------------	----------

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

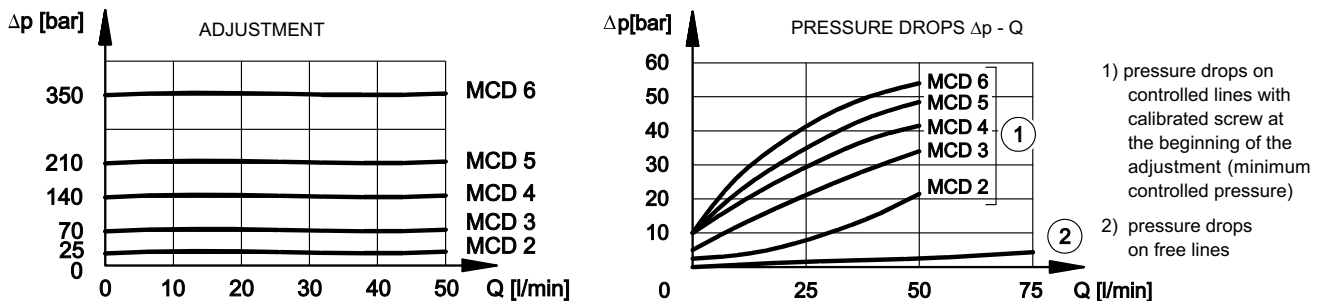
Configurations:  
**SP**: single on line P with discharge in T  
**SAT**: single on line A with discharge in T  
**SBT**: single on line B with discharge in T  
**DT**: double on lines A-B with discharge in T  
**D**: double on lines A-B with crossed discharges  
**SB**: single on line B with discharge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

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)

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



## 3 - HYDRAULIC FLUIDS

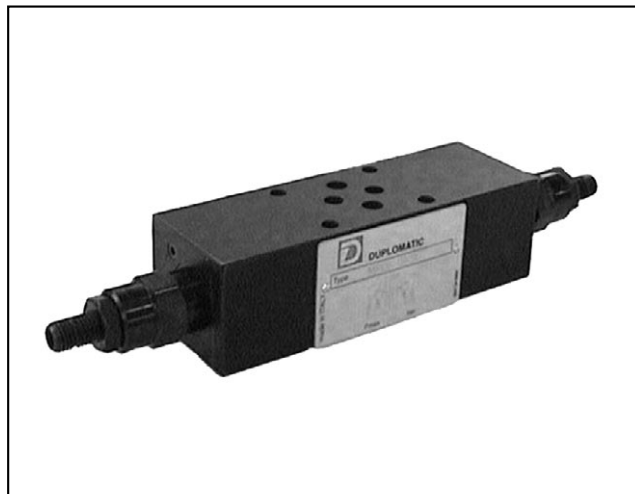
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures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

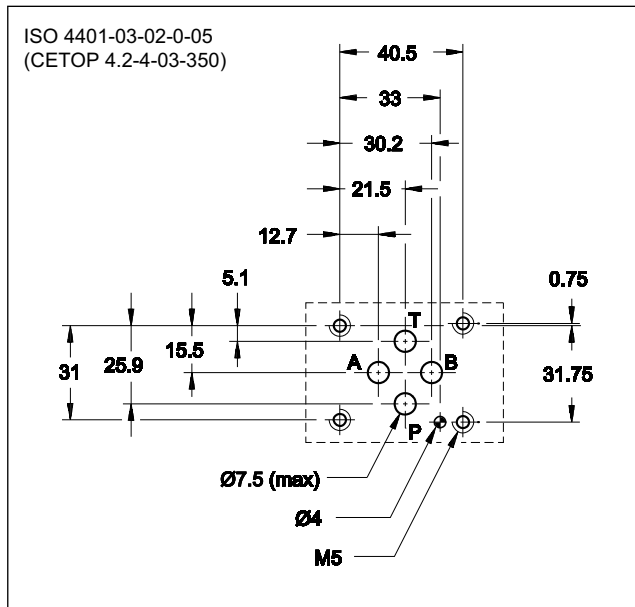
## VÁLVULA REGULADORA DE PRESION PILOTADA

### SERIE 51

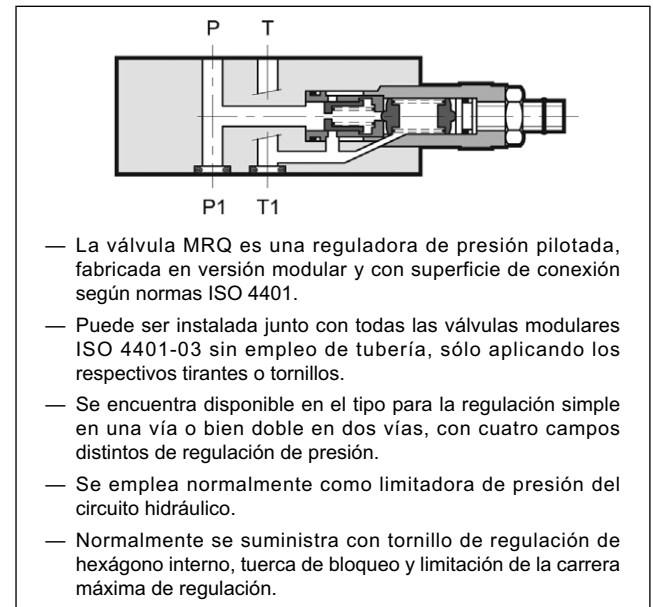
**TIPO MODULAR**  
**ISO 4401-03**

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

**PLANO DE ASIENTO**



**PRINCIPIO DE FUNCIONAMIENTO**



**VERSIONES** (ver tabla Símbolos Hidráulicos)

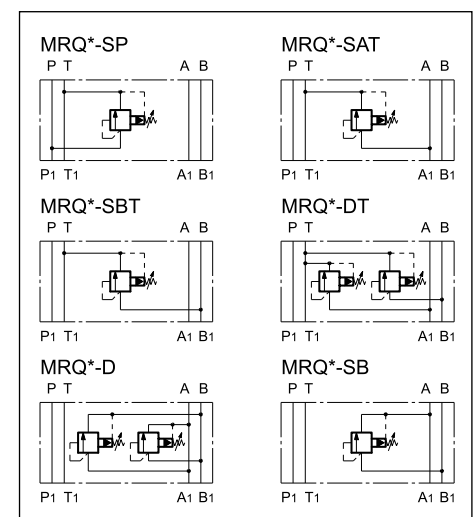
- Versión "SP": regula la presión en la vía P con descarga en T.
- Versión "SAT": regula la presión en la vía A con descarga en T.
- Versión "SBT": regula la presión en la vía B con descarga en T.

- 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 $\Delta p-Q$	
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

<b>M</b>	<b>R</b>	<b>Q</b>	<b>-</b>	<b>/</b>	<b>/</b>	<b>51</b>	<b>/</b>
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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:

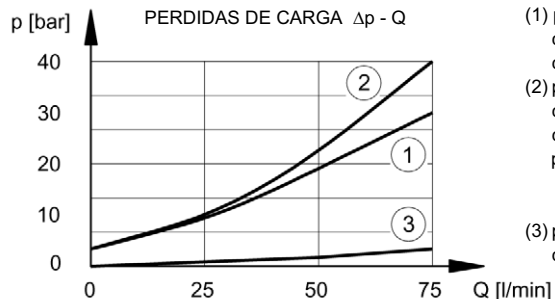
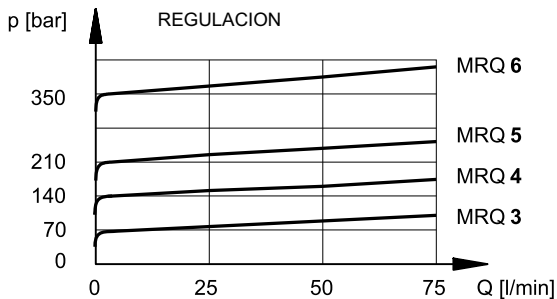
**SP**: simple en la vía P con descarga en T.      **DT**: doble en las vías A-B con descarga en T.  
**SAT**: simple en la vía A con descarga en T.    **D**: doble en las vías A-B con descargas cruzadas.  
**SBT**: simple en la vía B con descarga en T.    **SB**: simple en la vía B con descarga en A.

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

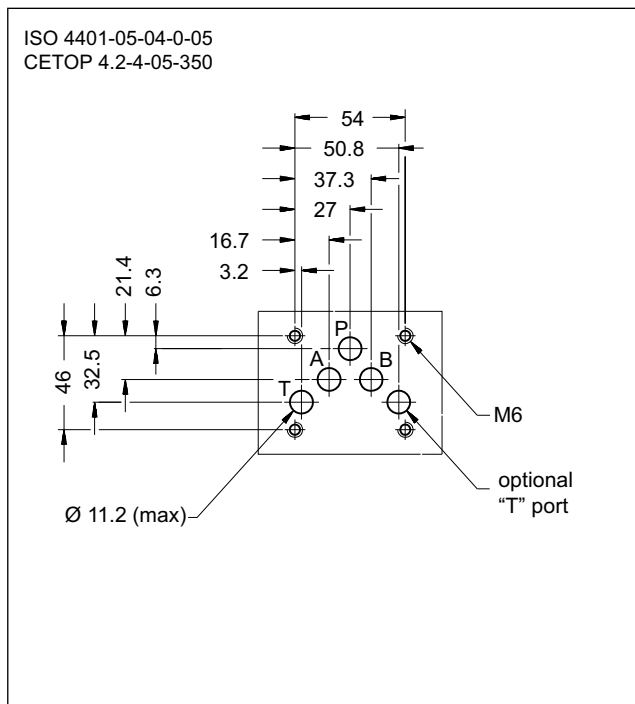
## PILOT OPERATED PRESSURE RELIEF VALVE

### SERIES 10

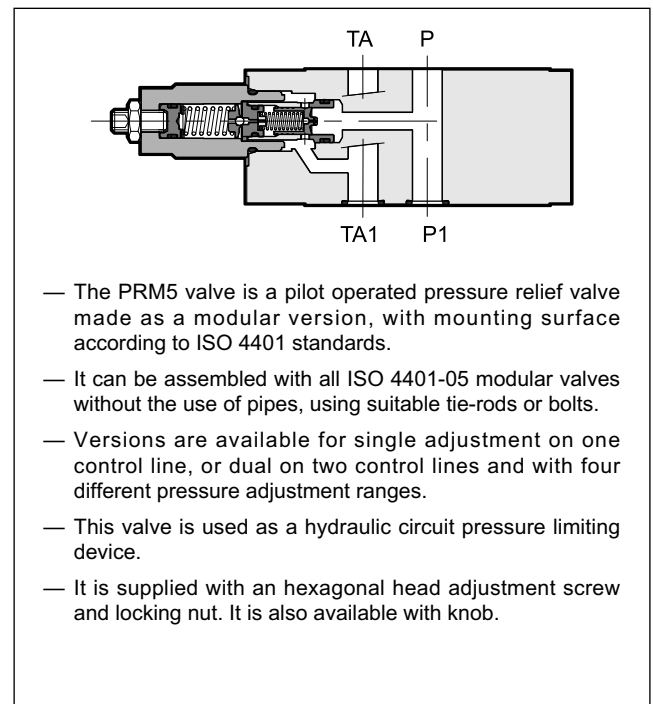
#### MODULAR VERSION ISO 4401-05

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

#### MOUNTING SURFACE



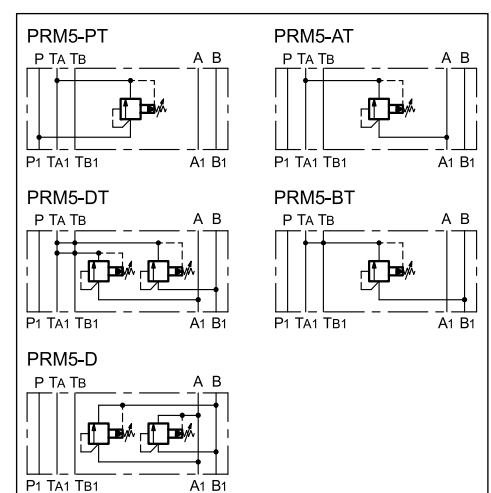
#### OPERATING PRINCIPLE



#### 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

<b>P</b>	<b>R</b>	<b>M</b>	<b>5</b>	-	/	<b>10</b>	/	
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Pilot operated pressure relief valve  
 Modular version  
 ISO 4401-05 size

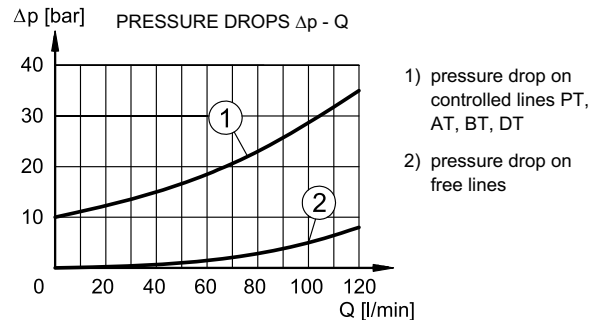
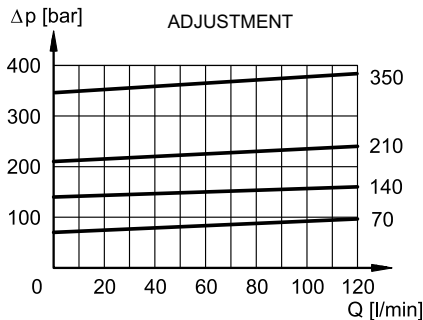
Versions:  
**PT**: single on line P with discharge in TA  
**AT**: single on line A with discharge in TA  
**BT**: single on line B with discharge in TA and TB  
**DT**: double on lines A-B with discharge in TA and TB  
**D**: double on lines A-B with cross discharge

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

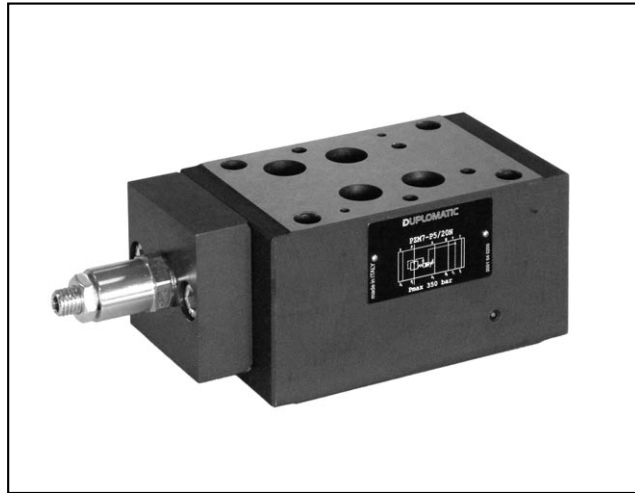
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at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

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

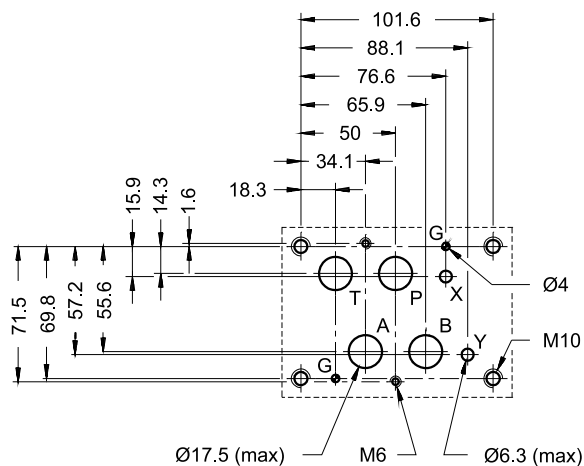
## PRESSURE RELIEF VALVE, PILOT OPERATED SERIES 20

### MODULAR VERSION ISO 4401-07

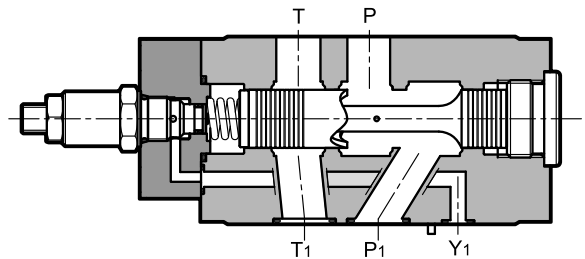
**p** max 350 bar  
**Q** max 300 l/min

### MOUNTING INTERFACE

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



### OPERATING PRINCIPLE



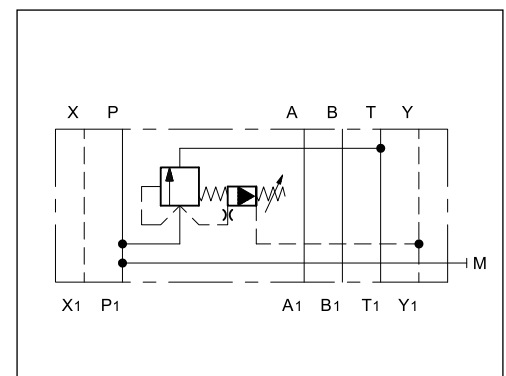
- The PRM7 valve is a pilot operated pressure relief valve made as a modular version with a mounting surface according to ISO 4401-07 standards.
- It can be assembled with all ISO 4401-07 modular valves without the use of pipes, using suitable tie-rods or bolts.
- This valve is used as a hydraulic circuit 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

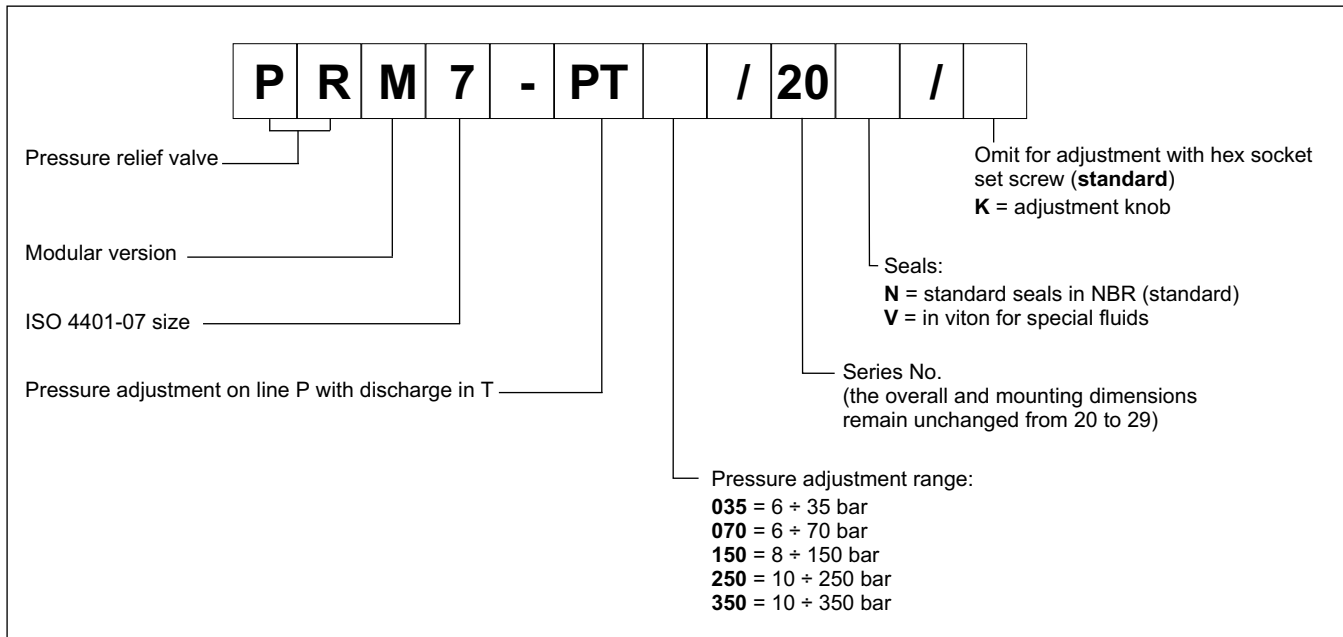
(measured with mineral oil of viscosity 36 cSt at 50°C)

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

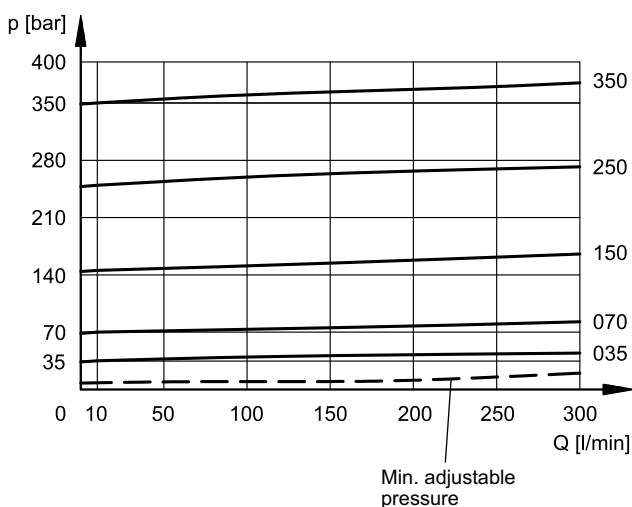
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures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

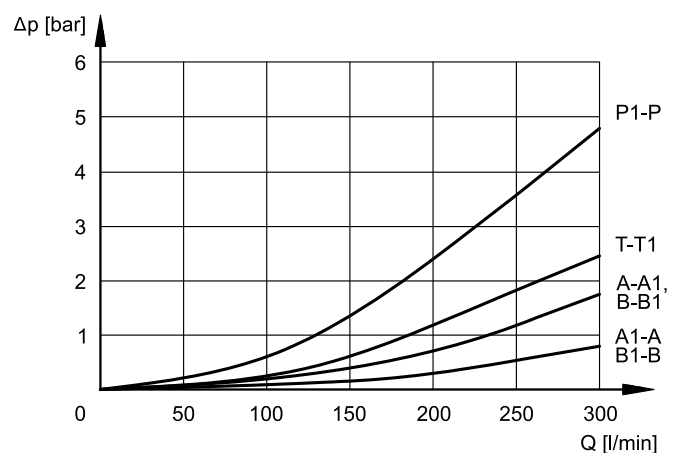
## 2 - CHARACTERISTIC CURVES

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

**ADJUSTMENT**

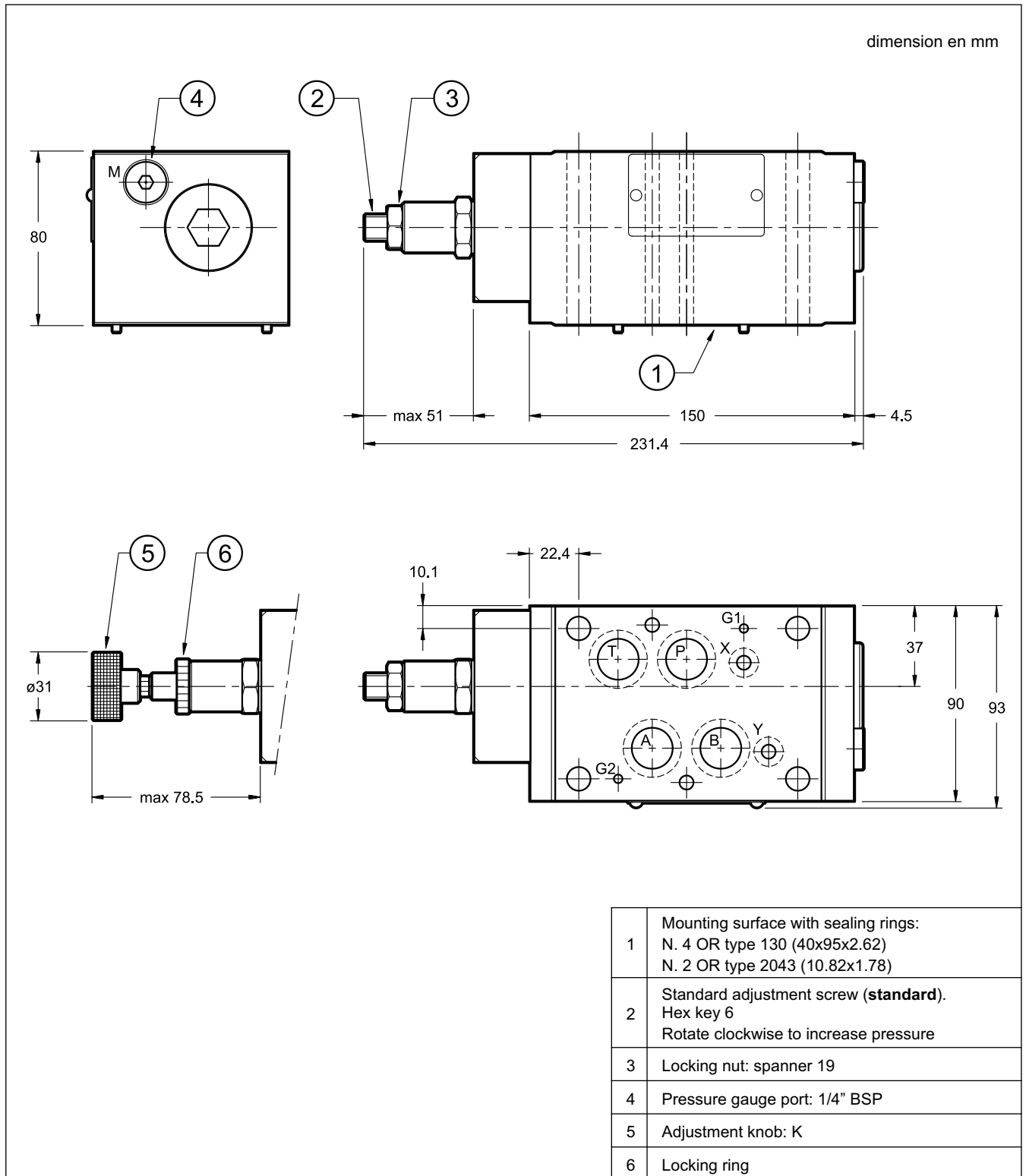


**PRESSURE DROPS  $\Delta p$  - Q**





## 4 - OVERALL AND MOUNTING DIMENSIONS





# PRM7

SERIES 20



**DIPLOMATIC MS S.p.A.**

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