



# QTM2

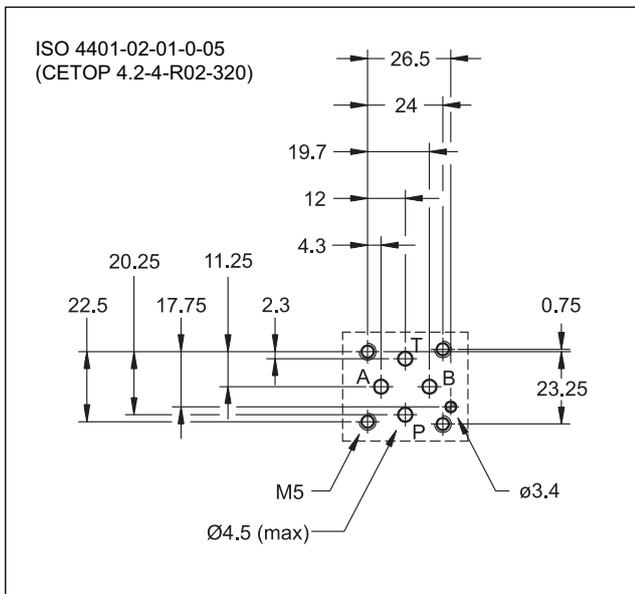
## FLOW RESTRICTOR VALVE

### SERIES 10

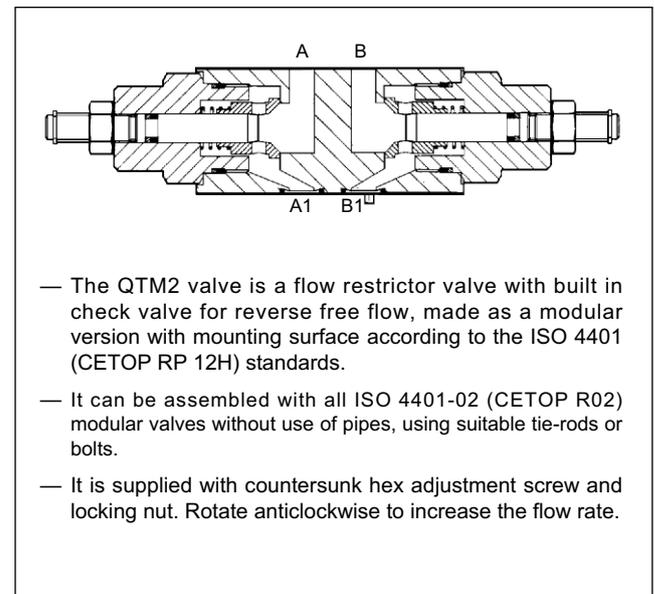
**MODULAR VERSION**  
**ISO 4401-02 (CETOP R02)**

**p** max **320** bar  
**Q** max **30** l/min

#### MOUNTING SURFACE



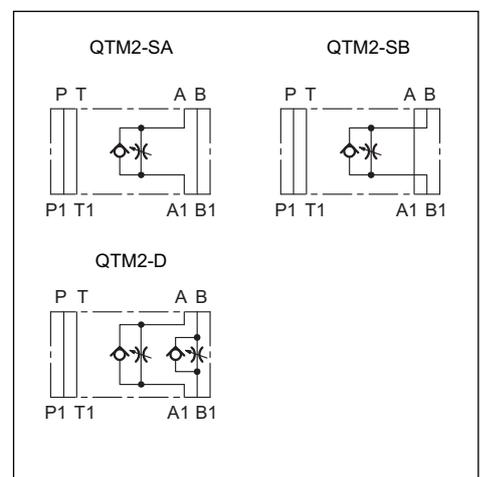
#### OPERATING PRINCIPLE



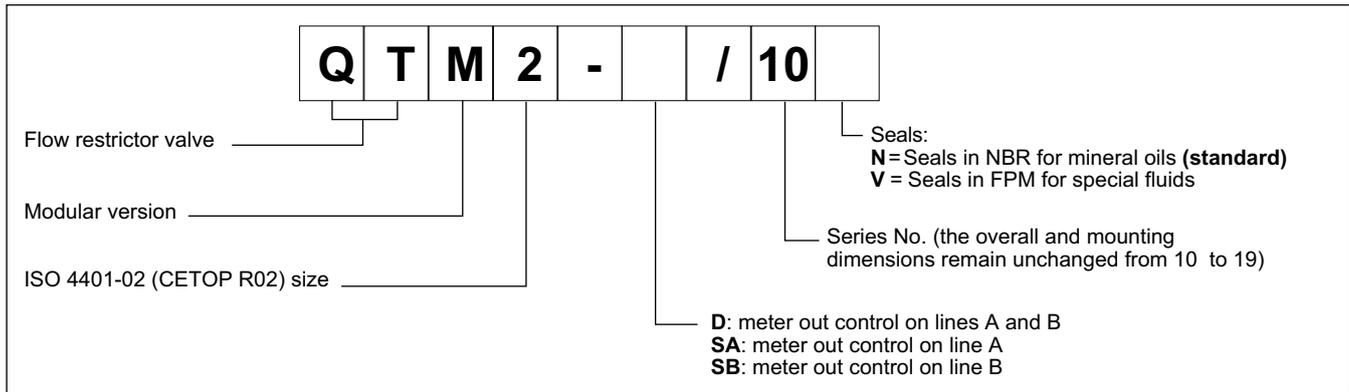
#### PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	320
Maximum flow rate	l/min	30
Ambient temperature range	°C	-20 / +50
Check valve opening pressure	bar	0,4
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	0,8

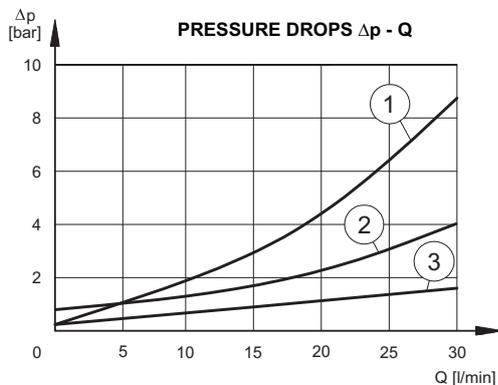
#### HYDRAULIC SYMBOLS



### 1 - IDENTIFICATION CODE



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



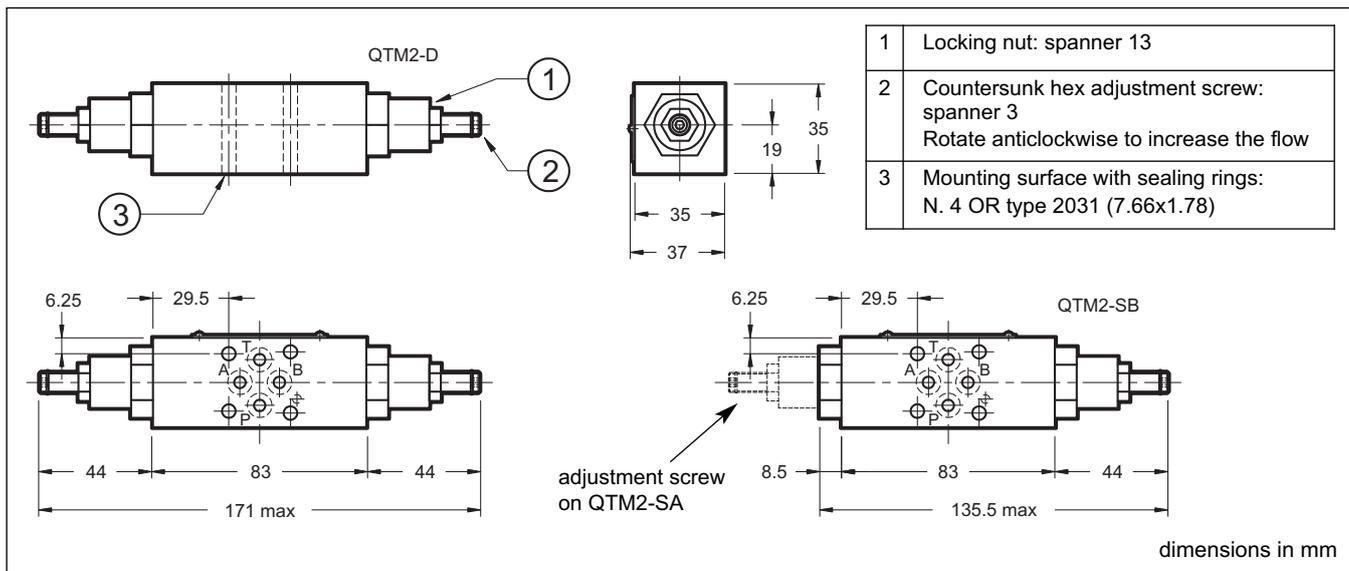
Typical  $\Delta p - Q$  curves obtained with QTM2-D valve, with throttling axis at full retraction.

- 1) pressure drops A<sub>1</sub> - A (B<sub>1</sub> - B)
- 2) pressure drops A - A<sub>1</sub> (B - B<sub>1</sub>)
- 3) pressure drops through the free ports

### 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





# MERS

## FLOW RESTRICTOR VALVE

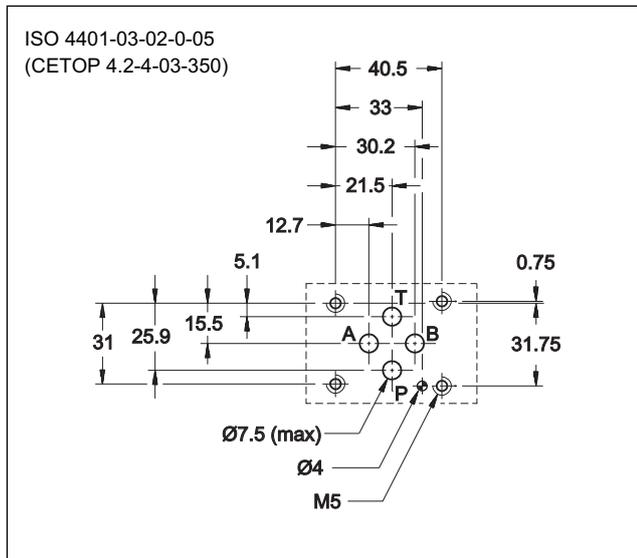
### SERIES 50

#### MODULAR VERSION

#### ISO 4401-03 (CETOP 03)

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

#### MOUNTING INTERFACE



#### OPERATING PRINCIPLE

- This is a non-compensated flow control valve with a check valve for reverse free flow. It is made in the modular version and with mounting surface according to the ISO 4401 (CETOP RP 121 H) standards; it can be assembled quickly without use of pipes, but using only suitable tie-rods or bolts, thus forming compact modular groups.
- It is also available as a reversible valve (G\* versions). Meter-in or meter-out control depending on the way of assembly the valve on the OR subplate.
- All the configurations have an incorporated check valve that allows reverse free flow (cracking pressure of 0,5 bar).
- It is normally supplied with a hexagonal head adjustment screw.

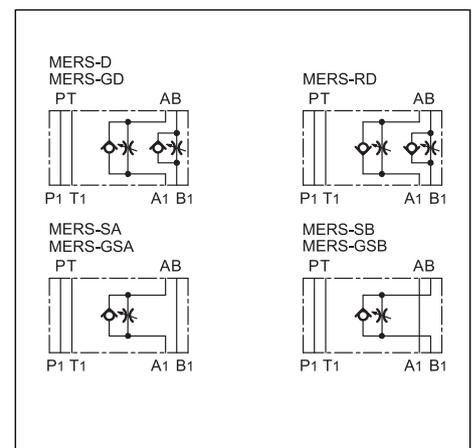
#### CONFIGURATIONS (see hydraulic symbols table)

- “SA”: control of the flow exiting from the actuator on line A .
- “SB”: control of the flow exiting from the actuator on line B.
- “D”: Allows an independent flow control exiting from the two chambers of the actuator. (Standard)
- “RD”: Allows an independent flow control entering in the two chambers of the actuator.
- “G\*”: Reversible valve. See at par. 1

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

Maximum operating pressure	bar	350
Check valve cracking pressure		0,5
Maximum flow rate in the controlled lines	l/min	50
Maximum flow rate in the free lines		75
Min. controlled flowrate with $\Delta p$ 10 bar		$\leq 0,060$
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	1,3

#### HYDRAULIC SYMBOLS



## 1 - IDENTIFICATION CODE

	<b>M</b>	<b>E</b>	<b>R</b>	<b>S</b>	<b>-</b>		<b>/</b>		<b>/</b>	<b>50</b>	<b>/</b>	
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ISO 4401-03 (CETOP 03) size Modular version

Flow restrictor valve with check valve for reverse free flow

Configurations:

- D:** meter out control on lines A and B (**standard**)
- RD:** meter in control on lines A and B
- SA:** meter out control on line A
- SB:** meter out control on line B

Configurations G\* - reversible valve (**NOTE**)

- GD:** control on lines A and B
- GSA:** control on lines A
- GSB:** control on lines A

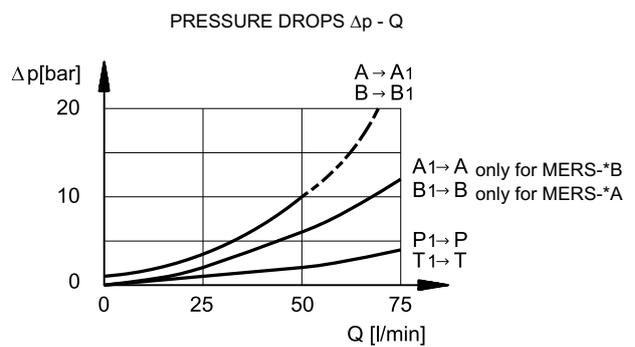
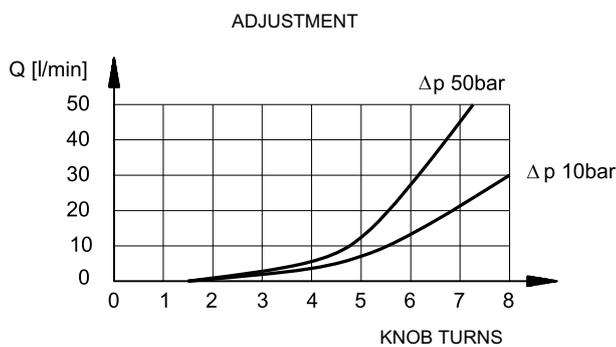
Seals: omit for mineral oils  
**V** = viton for special fluids

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

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

**NOTE:** the valve body does not provide the OR seats. The mounting interface is achieved by interposition of an OR subplate. The control of flow (meter-in or meter-out) is depending on the way of assembly the valve on the subplate.

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

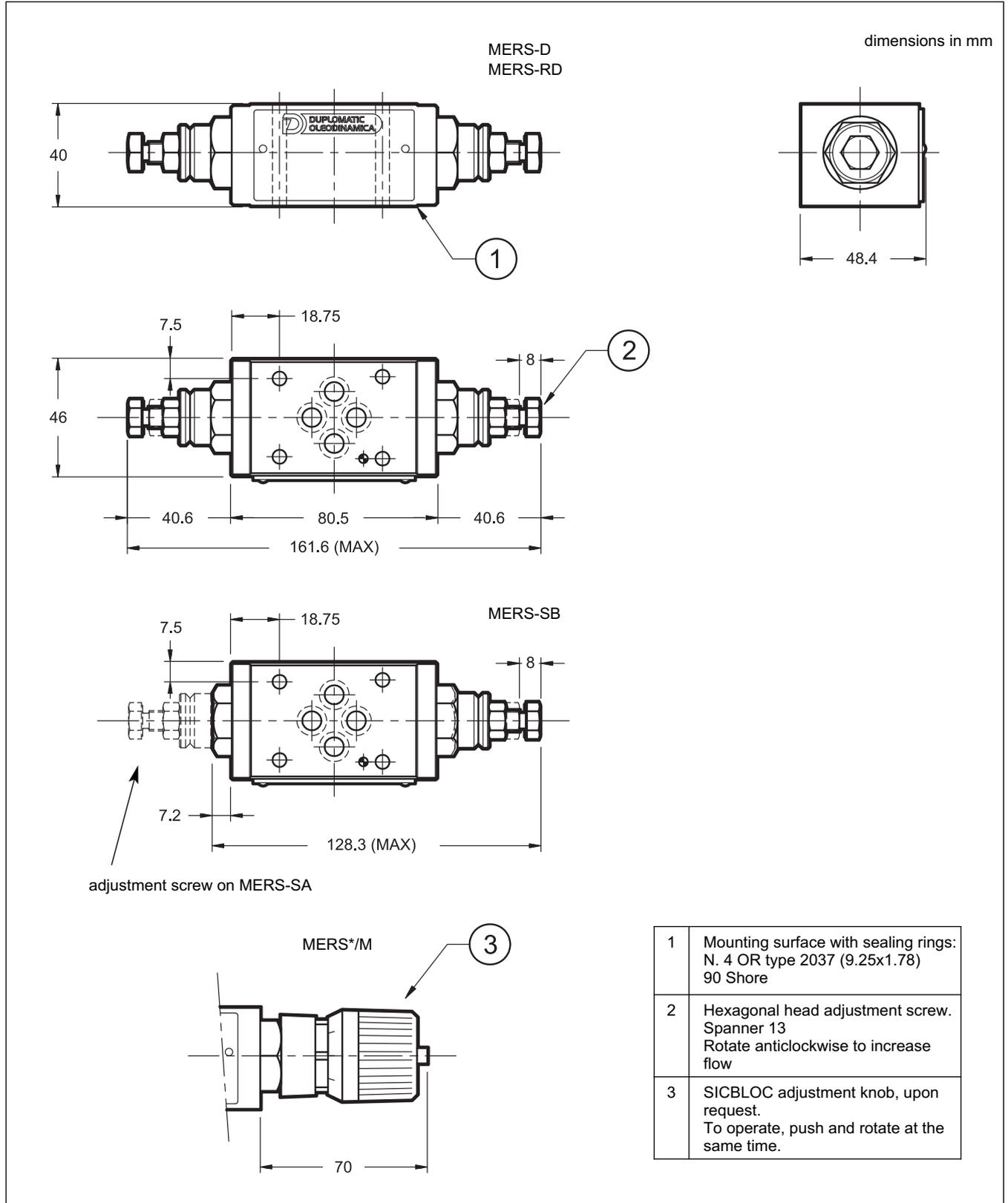


## 3 - HYDRAULIC FLUIDS

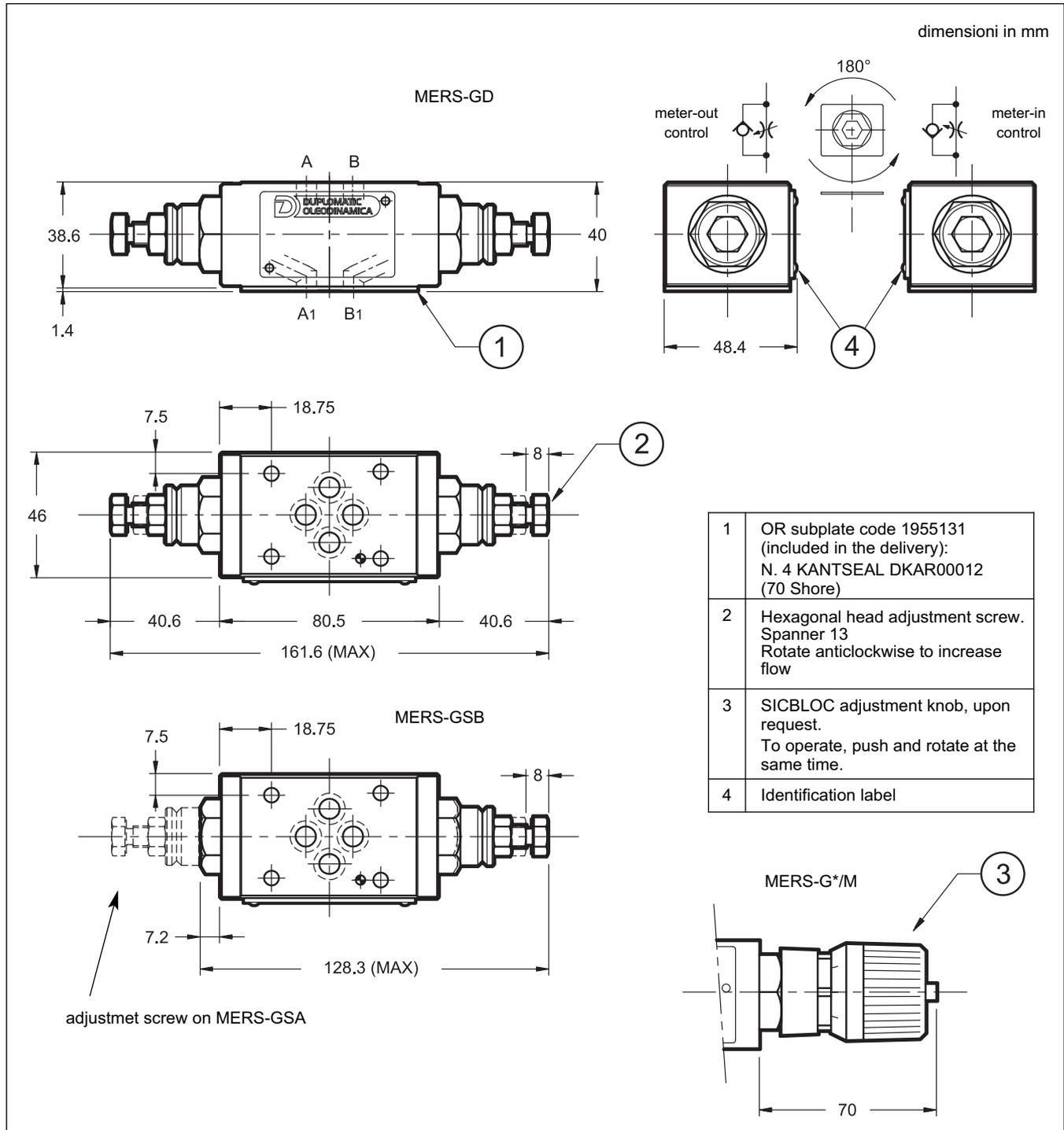
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures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



## 4 - OVERALL AND MOUNTING DIMENSIONS MERS-G\*





# QTM5

## FLOW RESTRICTOR VALVE

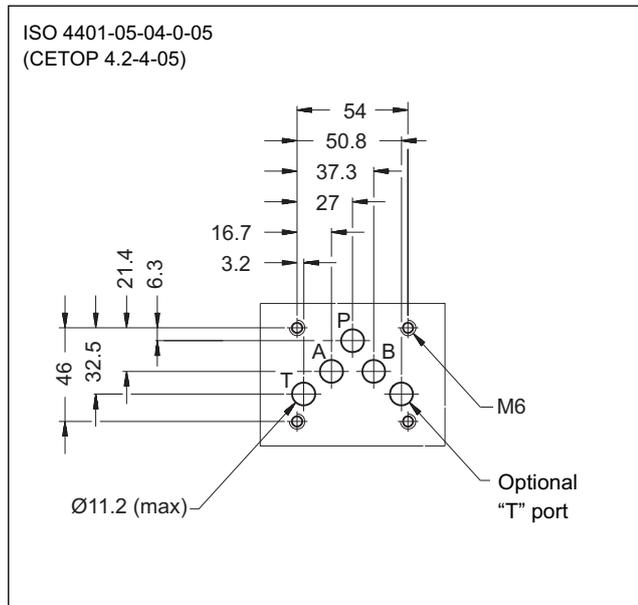
### SERIES 10

#### MODULAR VERSION

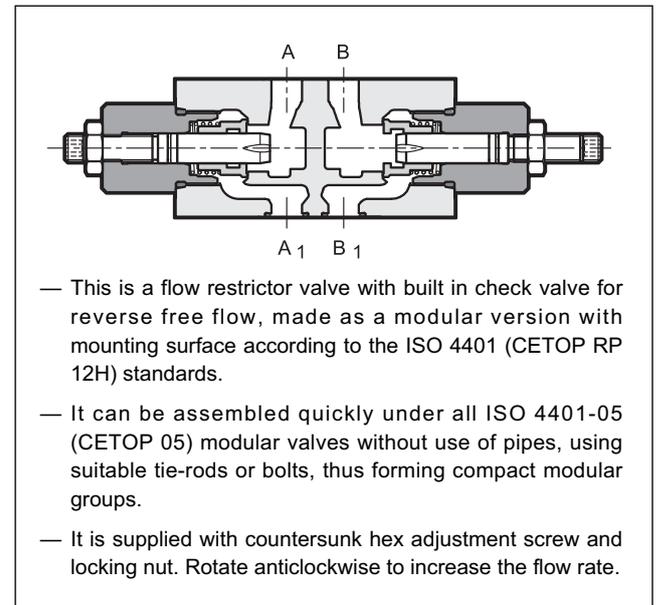
#### ISO 4401-05 (CETOP 05)

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

#### MOUNTING INTERFACE



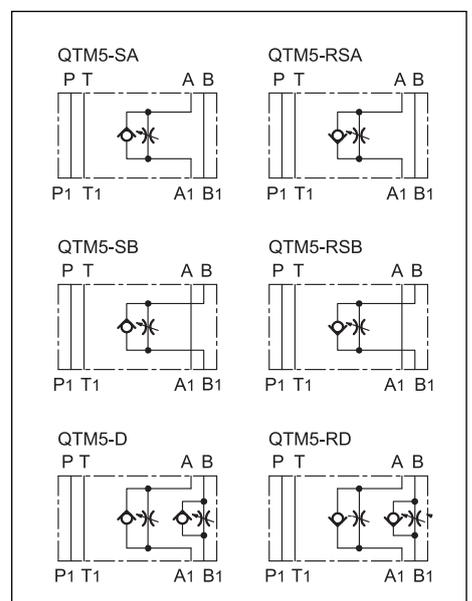
#### OPERATING PRINCIPLE



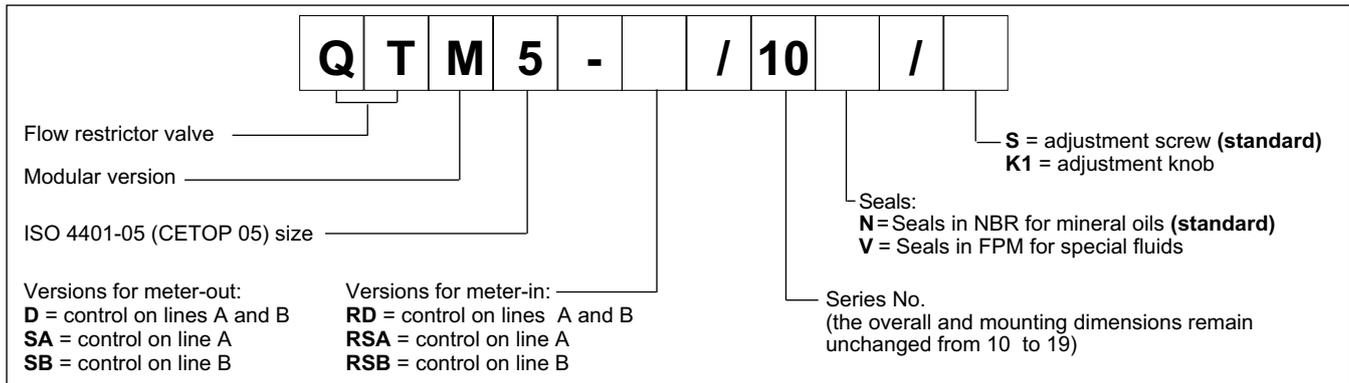
#### PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	350
Maximum flow rate	l/min	120
Cracking pressure	bar	0,5
Ambient temperature range	°C	-20 / +50
Fluid temperature range	°C	-20 / +80
Fluid viscosity range	cSt	10 ÷ 400
Recommended viscosity	cSt	25
Fluid contamination degree	According to ISO 4406:1999 class 20/18/15	
Mass: QTM5-SA, -SB, -RSA, -RSB	kg	2,3
QTM5-D, -RD	kg	2,5

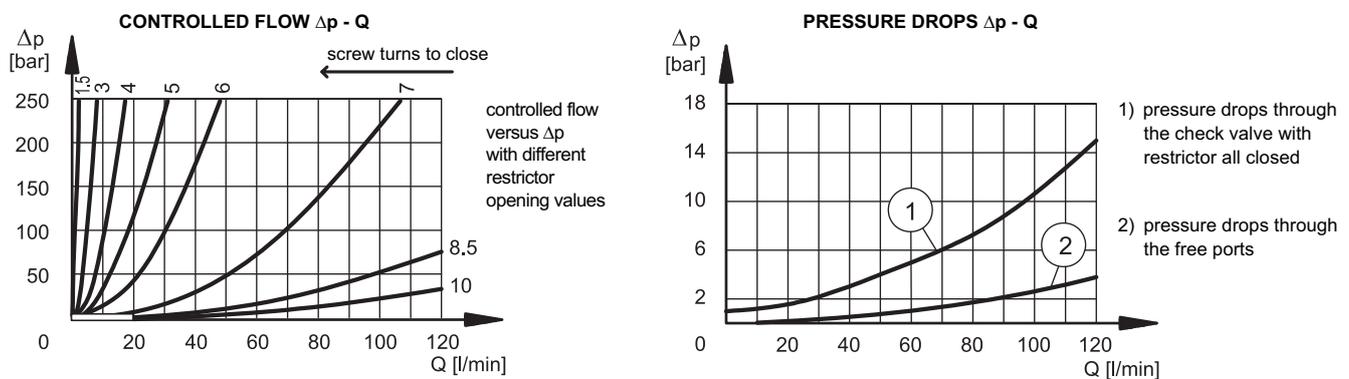
#### HYDRAULIC SYMBOLS



## 1 - IDENTIFICATION CODE



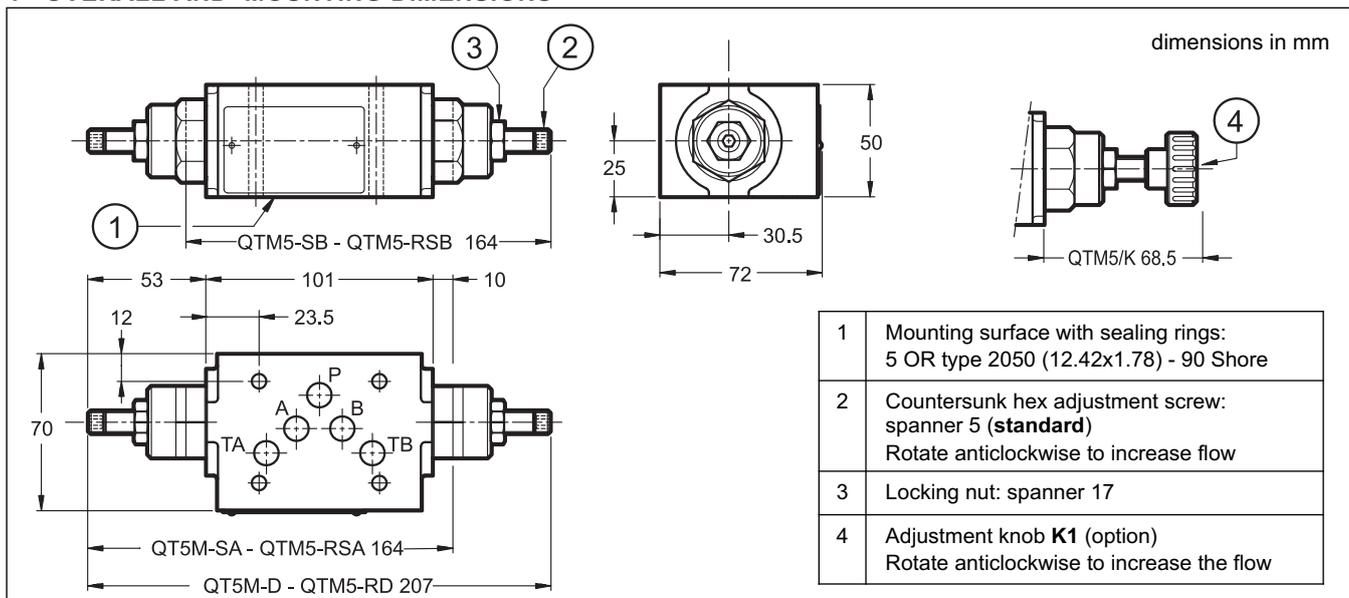
## 2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

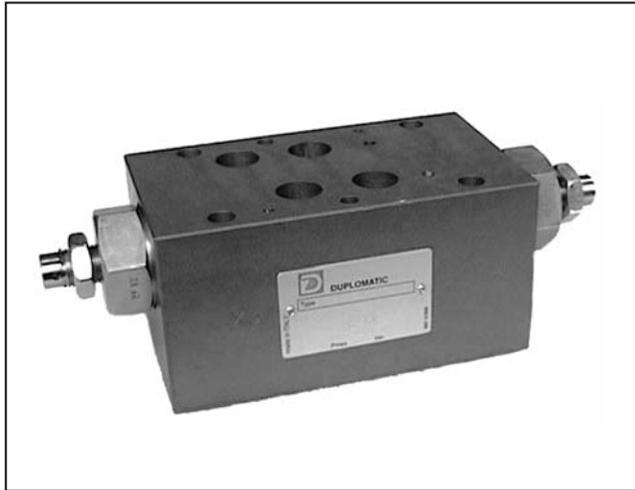


## 3 - HYDRAULIC FLUIDS

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





# QTM7

## FLOW RESTRICTOR VALVE

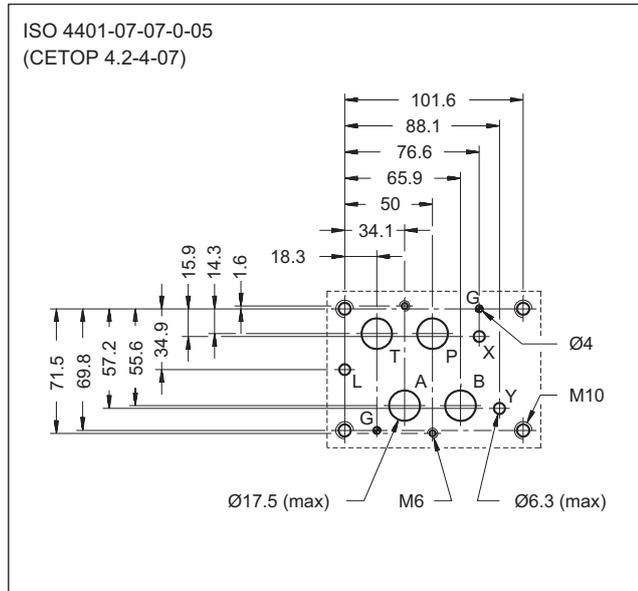
### SERIES 10

#### MODULAR VERSION

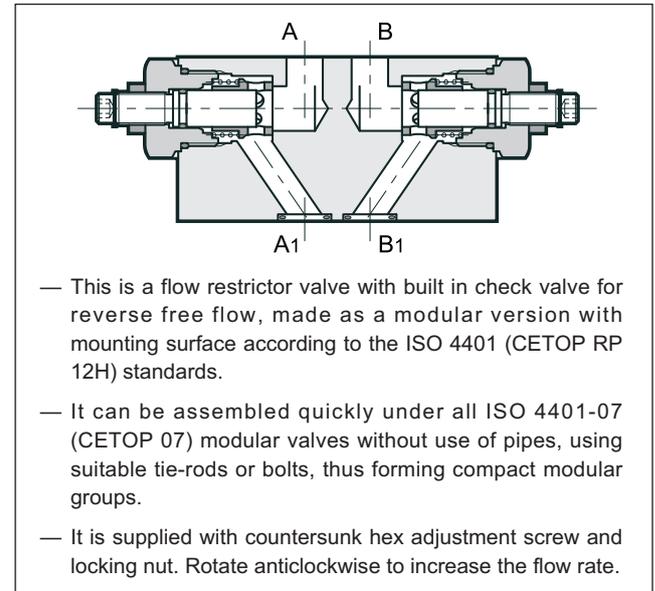
#### ISO 4401-07 (CETOP 07)

**p** max 350 bar  
**Q** max 250 l/min

#### MOUNTING INTERFACE



#### OPERATING PRINCIPLE



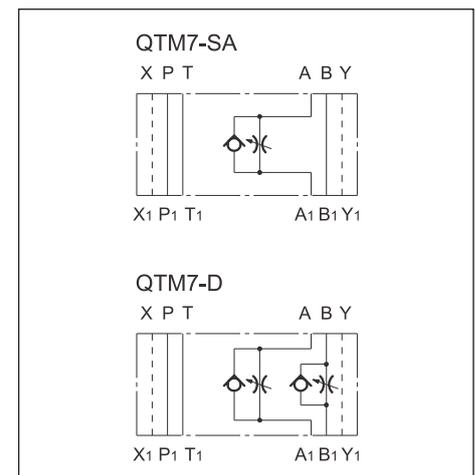
#### CONFIGURATIONS (see hydraulic symbols table)

- Configuration "SA": Allows the flow control exiting from the actuator on line A.
- Configuration "D": Allows independent control of the flow exiting from the chambers A and B of the actuator.
- All the configurations have a built-in check valve that allows free reverse flow (cracking pressure of 0,7 bar).

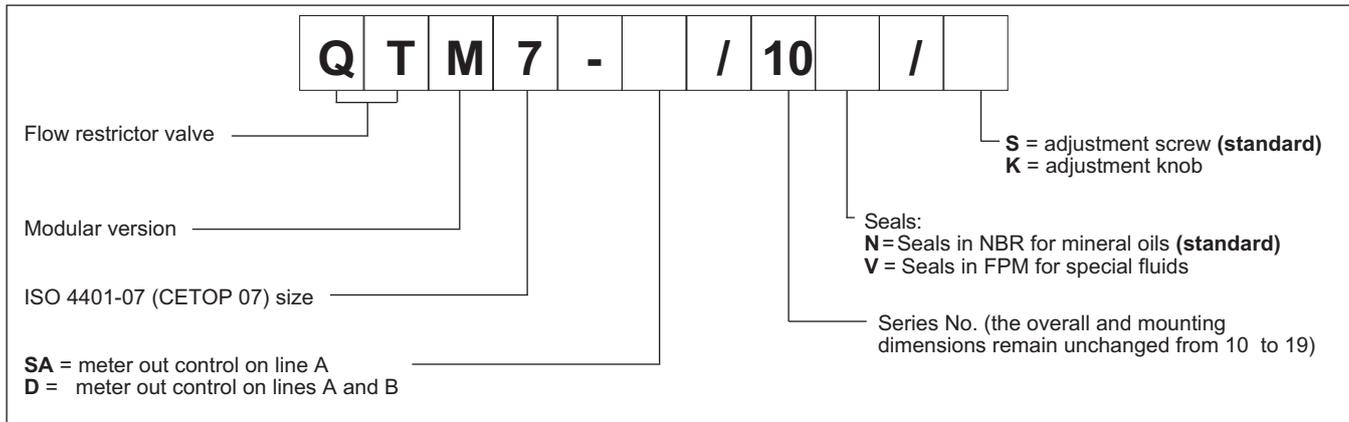
#### PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	350
Maximum flow rate	l/min	250
Leakage flow with restrictor closed	l/min	≤ 0,5
Check valve opening pressure	bar	0,7
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: QTM7-SA	kg	7,35
QTM7-D	kg	7,7

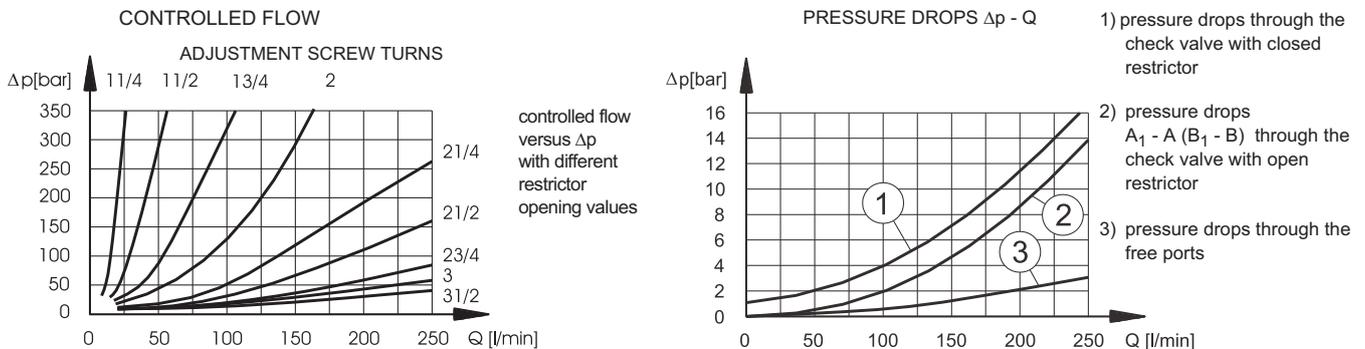
#### HYDRAULIC SYMBOLS



### 1 - IDENTIFICATION CODE



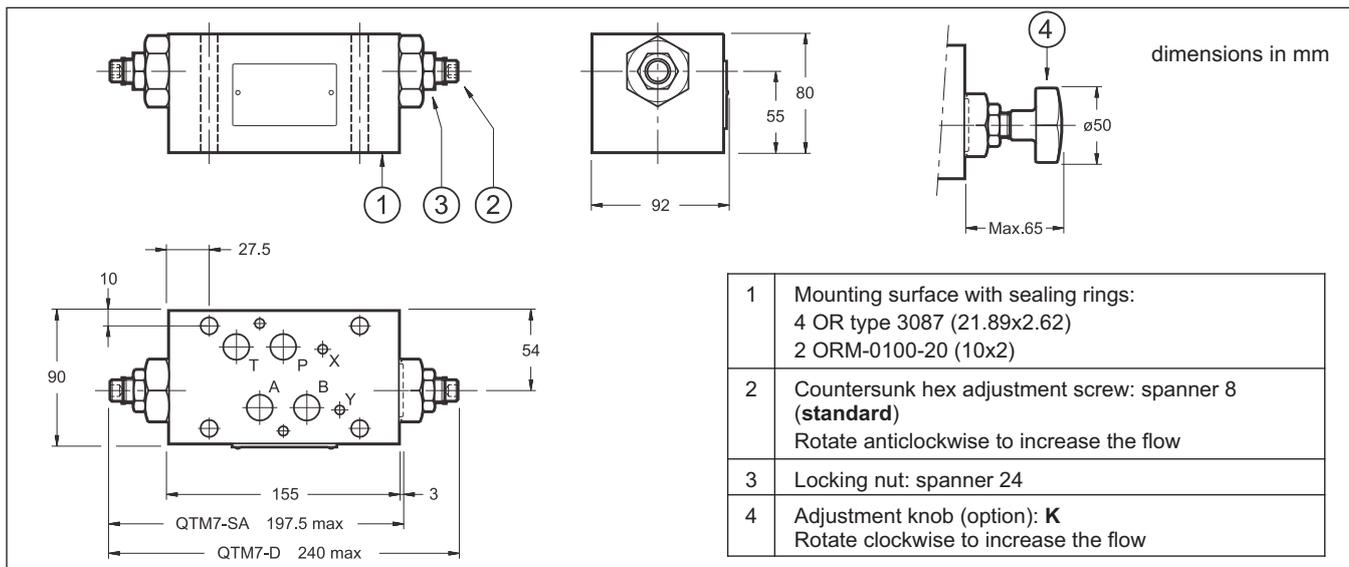
### 2 - CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)



### 3 - HYDRAULIC FLUIDS

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

### 4 - OVERALL AND MOUNTING DIMENSIONS





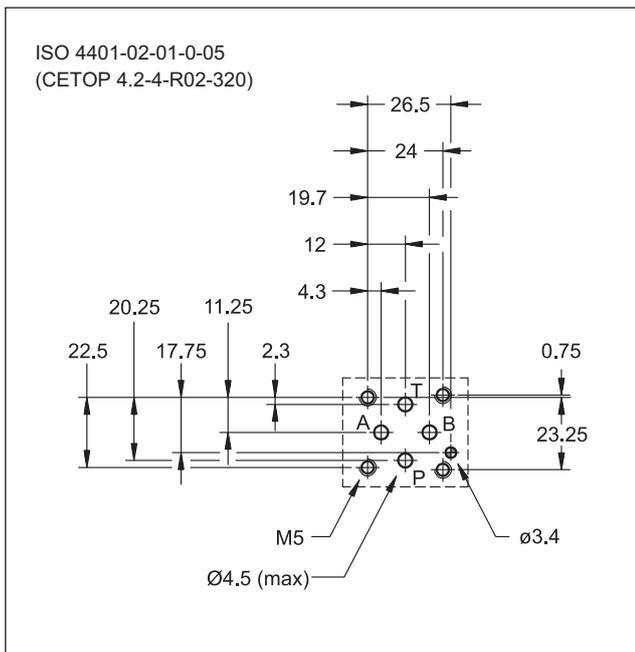
# CHM2

## PILOT OPERATED CHECK VALVE SERIES 10

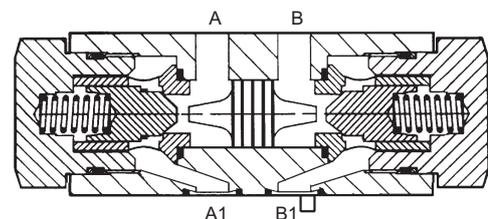
### MODULAR VERSION ISO 4401-02 (CETOP R02)

**p** max 320 bar  
**Q** max 30 l/min

#### MOUNTING SURFACE



#### OPERATING PRINCIPLE

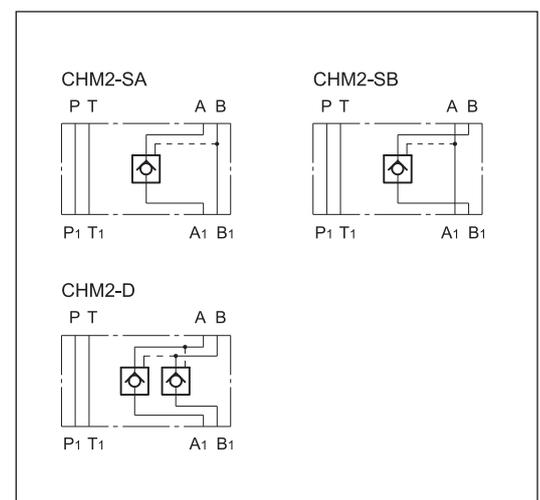


- The CHM2 valve is a hydraulically released check valve with spring closing and with cone on edge seals; the mounting surface is according to the ISO 4401 (CETOP RP 121H) standards.
- Its use allows:
  - prevention of flow in one direction;
  - flow in the same direction, if opened by a pilot pressure;
  - free flow in the other direction.
- The CHM2 valves are always mounted downstream of the DL2 type directional solenoid valves (see cat. 41 100) and can be assembled with all other ISO 4401-02 (CETOP R02) valves.

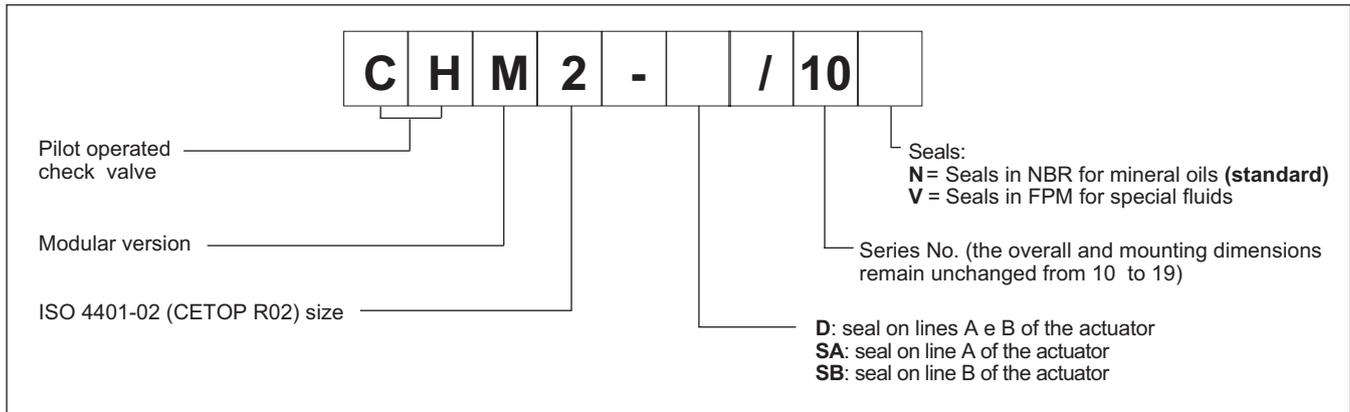
#### PERFORMANCE RATINGS (measured with mineral oil of viscosity 36 cSt at 50°C)

Maximum operating pressure	bar	320
Maximum flow rate	l/min	30
Ratio between pressure of the sealed chamber and the piloting pressure		3.5:1
Opening pressure	bar	2
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	0.75

#### HYDRAULIC SYMBOLS

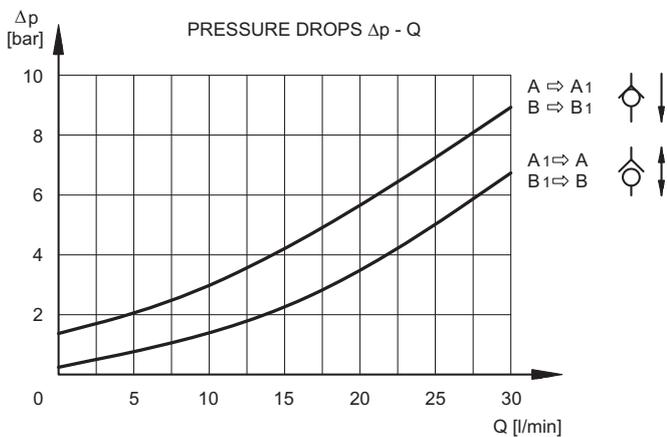


### 1 - IDENTIFICATION CODE



### 2 - CHARACTERISTIC CURVES

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



### 3 - HYDRAULIC FLUIDS

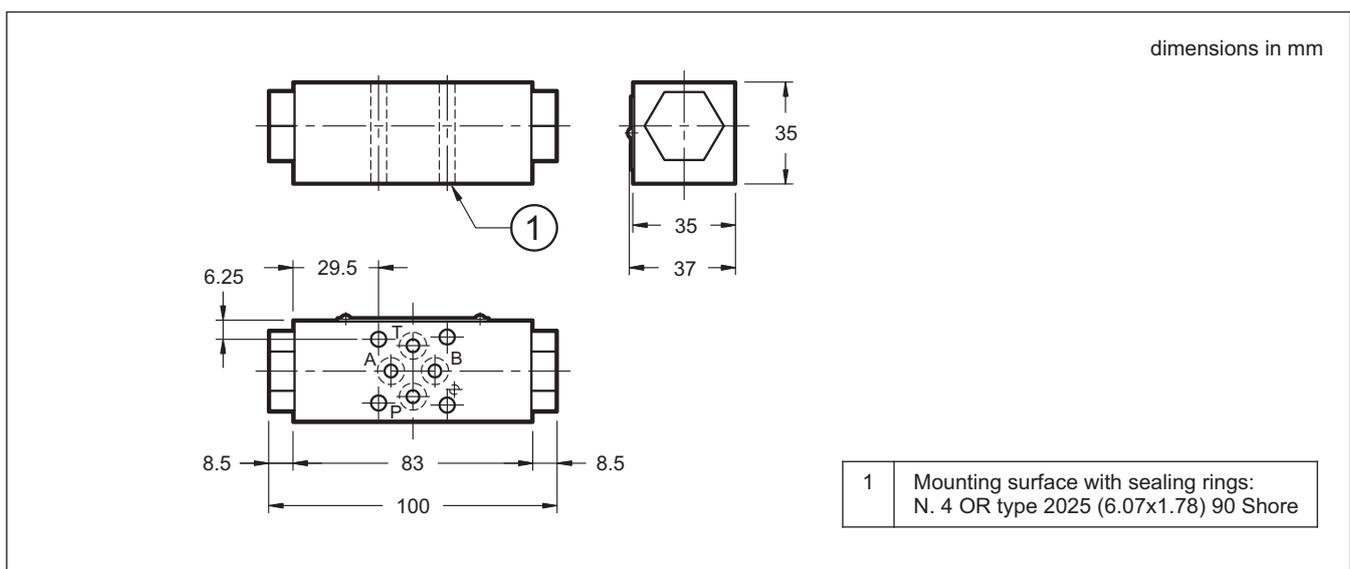
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. With this kind of fluids, use NBR seals type (code N). With HFDR fluids type (phosphate esters) use FPM seals (code V).

For the use of other fluid types 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 itself and of the seals characteristics.

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

### 4 - OVERALL AND MOUNTING DIMENSIONS





# MVR

## DIRECT CHECK VALVE

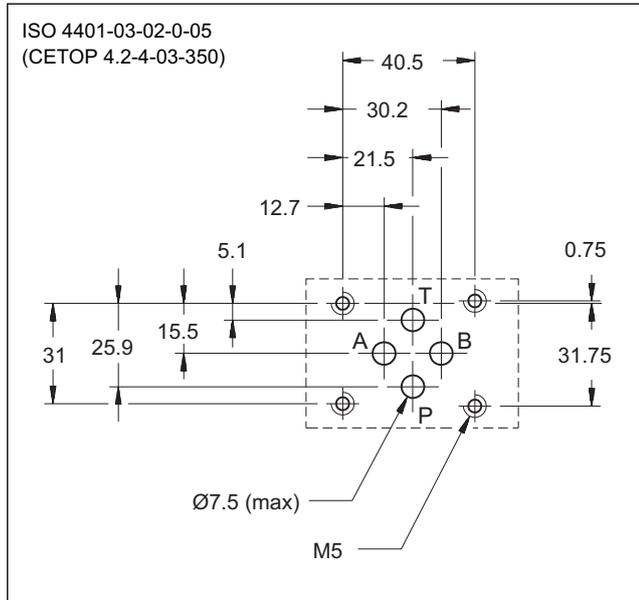
### SERIES 51

### MODULAR VERSION

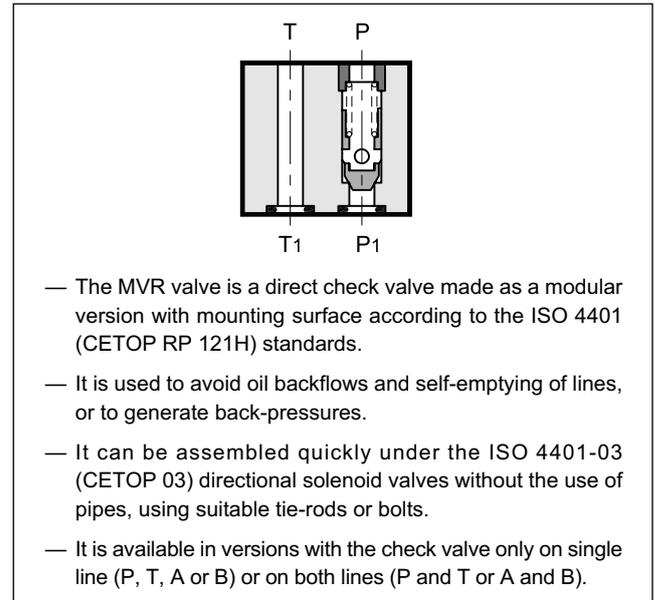
### ISO 4401-03 (CETOP 03)

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

### MOUNTING INTERFACE



### OPERATING PRINCIPLE



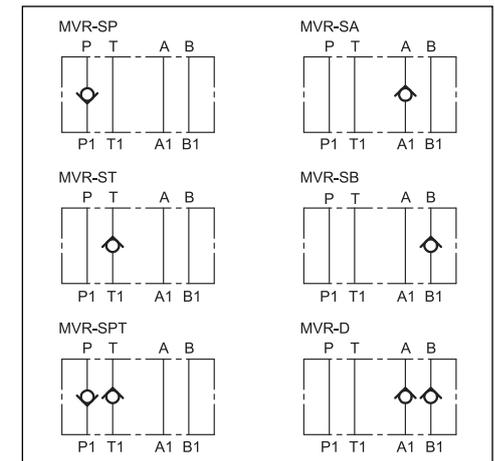
### CONFIGURATIONS (see Hydraulic symbols table)

- MVR-SP: check valve on line P.
- MVR-SA: check valve on line A.
- MVR-ST: check valve on line T.
- MVR-SB: check valve on line B.
- MVR-SPT: check valve on lines P and T.
- MVR-D: check valve on lines A and B.

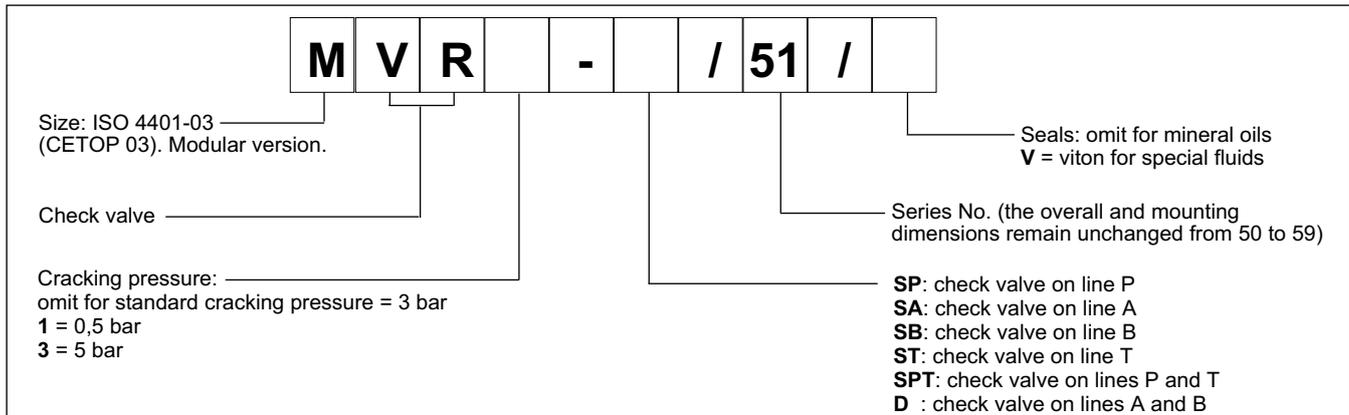
### PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	350
Check valve cracking pressure	bar	3 - 0,5 - 5
Maximum flow rate in controlled lines	l/min	50
Maximum flow rate in the free lines	l/min	75
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	1

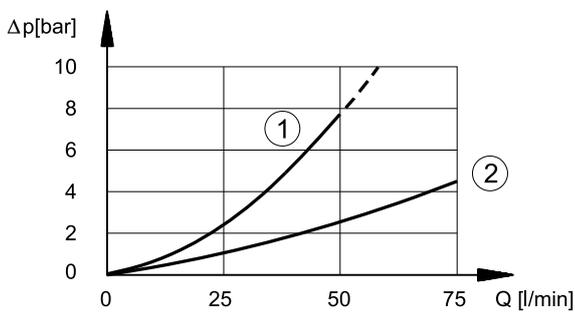
### HYDRAULIC SYMBOLS



### 1 - IDENTIFICATION CODE



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



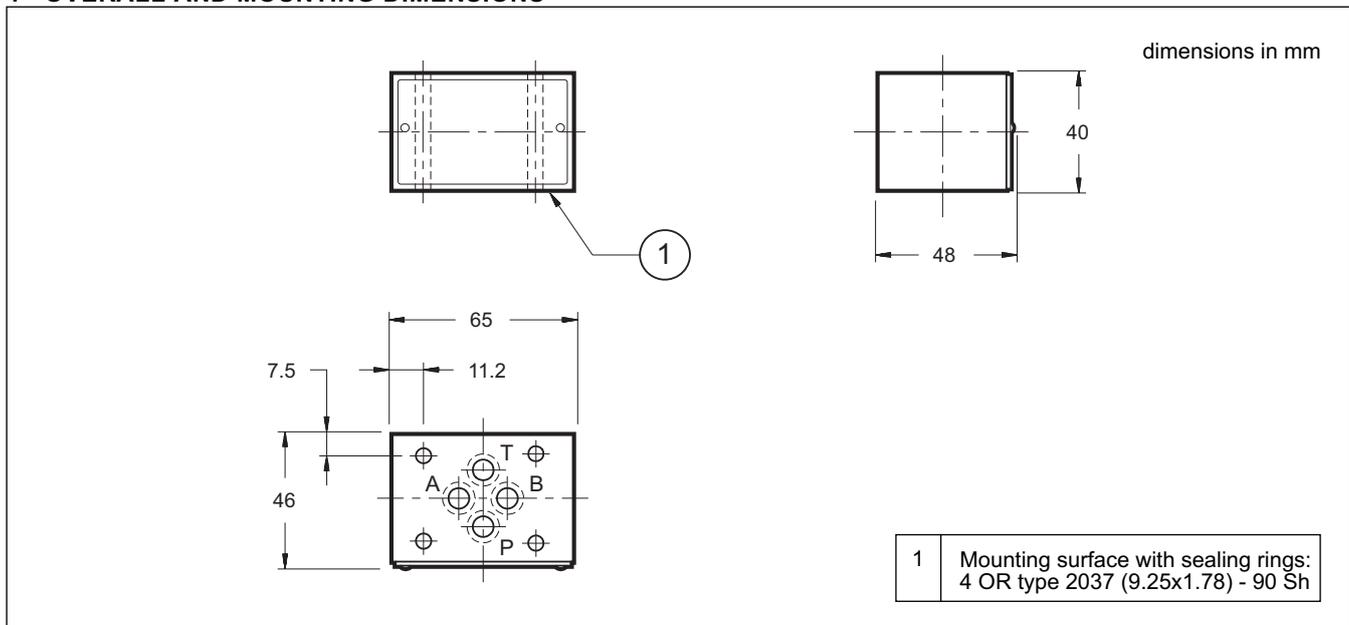
- 1) pressure drops on controlled lines
- 2) pressure drops on free lines

**NOTE:** check valve cracking pressure must be added to the values indicated in the curve 1 in the diagram

### 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





# MVR-RS/P

## DIRECT CHECK VALVE WITH FLOW RESTRICTOR

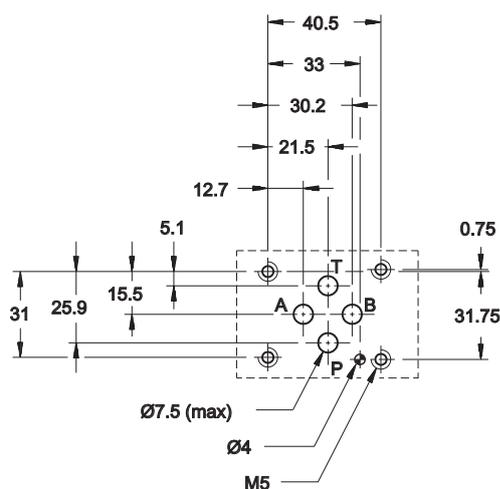
### SERIES 50

#### MODULAR VERSION ISO 4401-03

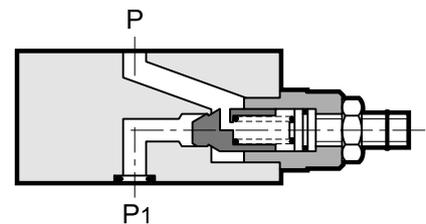
**p** max **350** bar  
**Q** max (see table of performances)

#### MOUNTING INTERFACE

ISO 4401-03-02-0-05  
(CETOP 4.2-4-03-350)



#### OPERATING PRINCIPLE

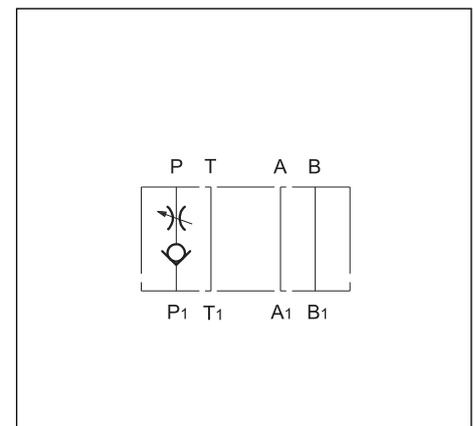


- The MVR-RS/P valve is a check valve that incorporates also the function of flow restriction.
- It is made as a modular version with mounting surface according to the ISO 4401-03 standards.
- It can be quickly assembled under the ISO 4401-03 directional solenoid valves and modular valves, without use of pipes and using suitable tie-rods or bolts.
- It is used when it is necessary to control the flow in a direction and to avoid backflows or the self-emptying of the lines in the opposite direction.
- Control of the flow is obtained with a countersunk hex screw with locking nut.

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

Maximum operating pressure	bar	350
Check valve cracking pressure		1
Maximum flow rate in controlled lines	l/min	50
Maximum flow rate in the free lines		75
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	1,1

#### HYDRAULIC SYMBOL

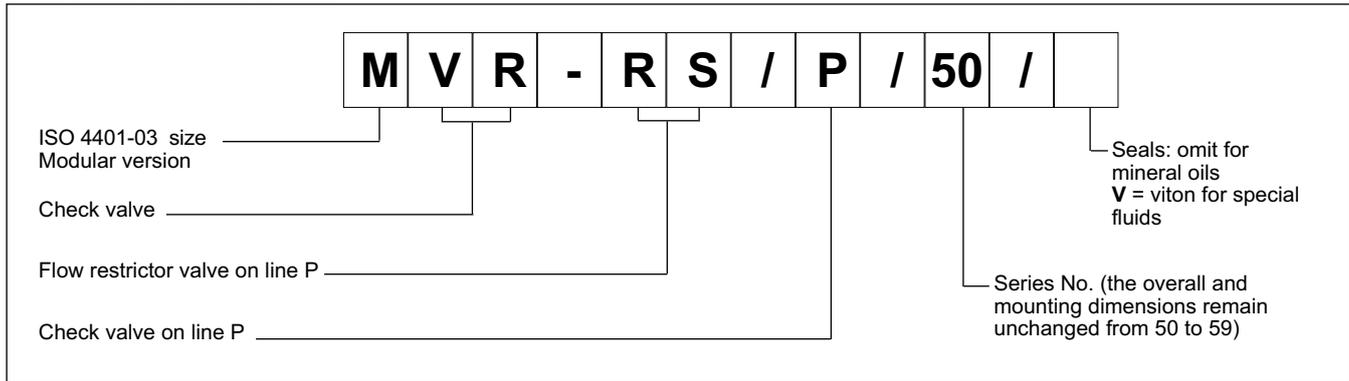




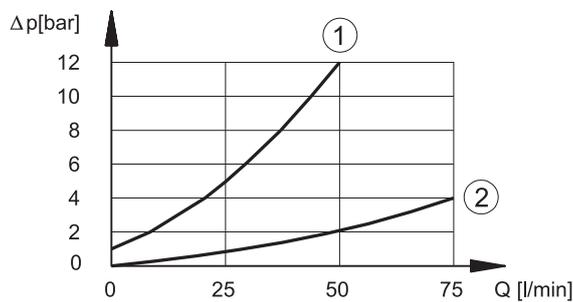
# MVR-RS/P

## SERIES 50

### 1 - IDENTIFICATION CODE



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

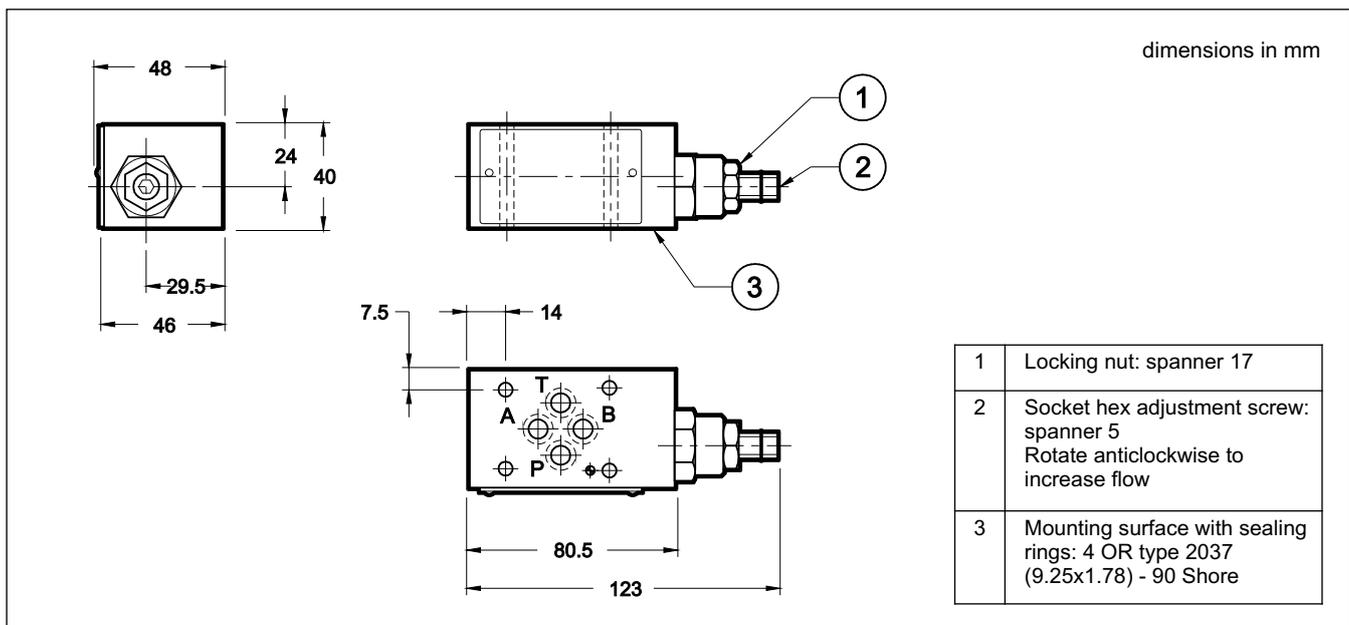


- 1) pressure drops P<sub>1</sub>→P
- 2) pressure drops on free lines (ex. A→A<sub>1</sub>)

### 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



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# MVPP

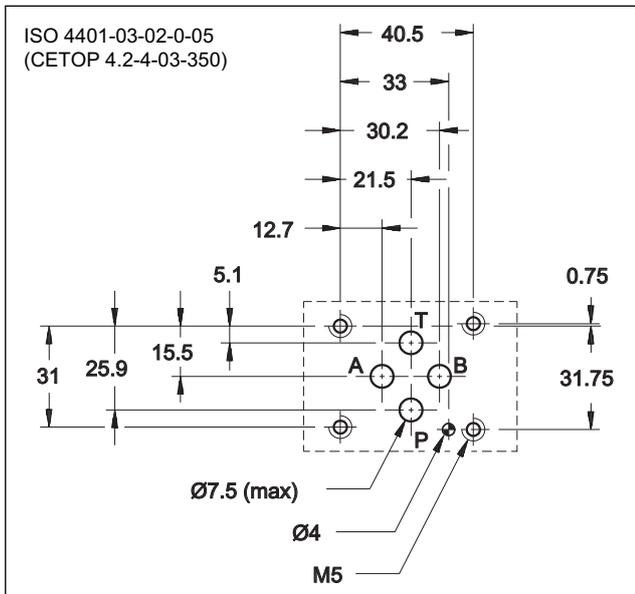
## PILOT OPERATED CHECK VALVE

### SERIES 50

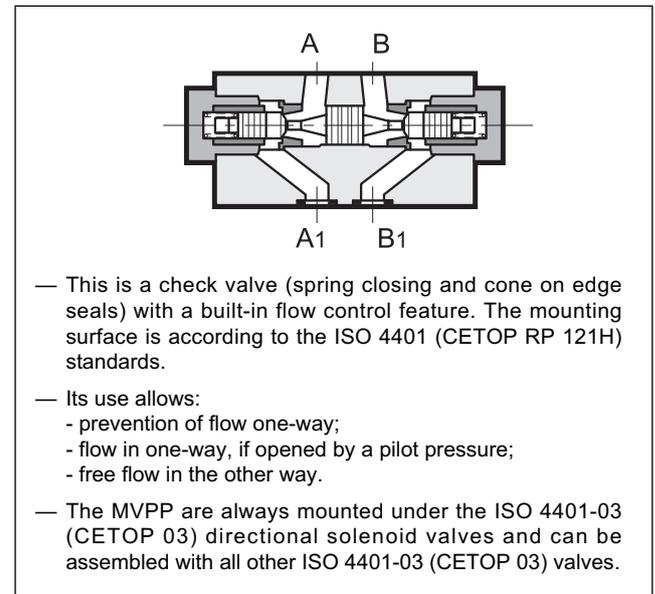
#### MODULAR VERSION ISO 4401-03 (CETOP 03)

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

#### MOUNTING SURFACE



#### OPERATING PRINCIPLE



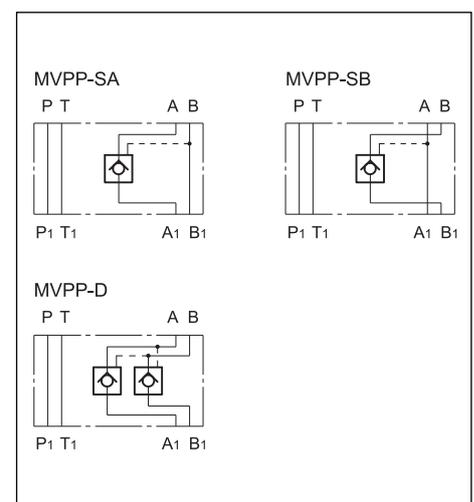
#### CONFIGURATIONS (see hydraulic symbols table)

- Configurations "SA" - "SB": are used to lock the actuator in one direction
- Configuration "D": is used to lock the position of the actuator in both directions

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

Maximum operating pressure	bar	350
Check valve cracking pressure		3
Maximum flow rate in controlled lines	l/min	50
Maximum flow rate in the free lines		75
Ratio between the pressure in the locked chambers and the piloting pressure		3,4:1
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	1,3

#### HYDRAULIC SYMBOLS

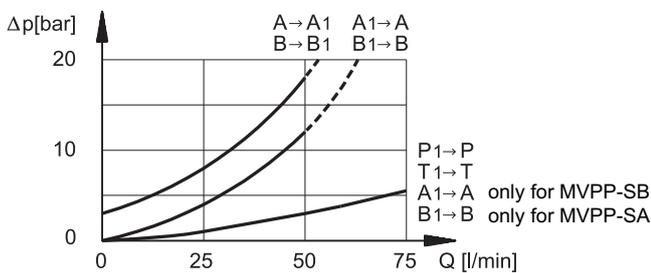


### 1 - IDENTIFICATION CODE

<p>ISO 4401-03 (CETOP 03) size Modular version</p> <p>Pilot operated check valve</p> <p>Configurations:  <b>SA</b> = seal on line A of the actuator  <b>SB</b> = seal on line B of the actuator  <b>D</b> = seal on lines A and B of the actuator</p>	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>M V P P - / 50 /</b> </div>	<p>Option:  <b>/ W7</b> = Zinc-nickel surface treatment          (see <b>NOTE</b>). Omit if not required.</p> <p>Seals: omit for mineral oils  <b>V</b> = viton for special fluids</p> <p>Series No. (the overall and mounting          dimensions remain unchanged from 50 to 59)</p>
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**NOTE:** Standard surface treatment: phosphating. The zinc-nickel finishing makes the valve suitable to ensure a salt spray resistance up to 600 hours.

### 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 shown: 7.5, 18.7, 46, 80.5, 96.

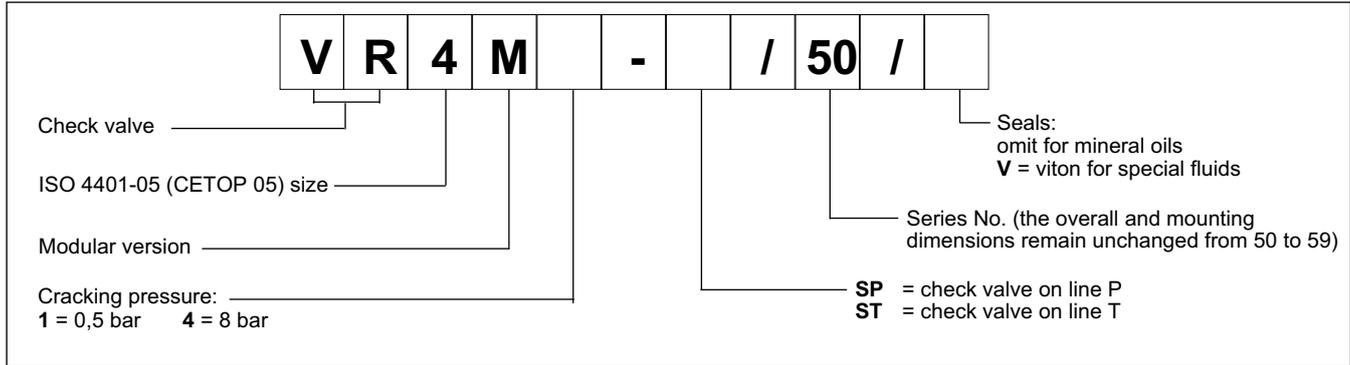
Dimensions shown: 48, 40.

dimensions in mm

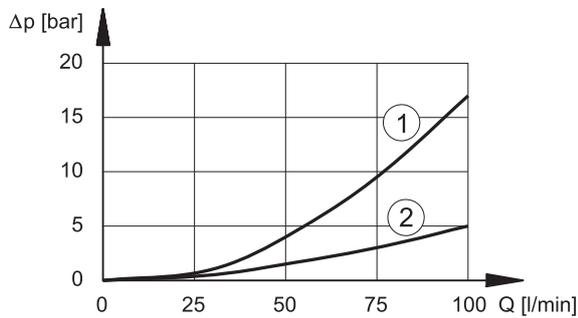
1 Mounting surface with sealing rings:  
4 OR type 2037 (9.25x1.78) - 90 Sh



### 1 - IDENTIFICATION CODE



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



1) pressure drops  $P_1 \rightarrow P$  and  $T \rightarrow T_1$  (controlled lines)

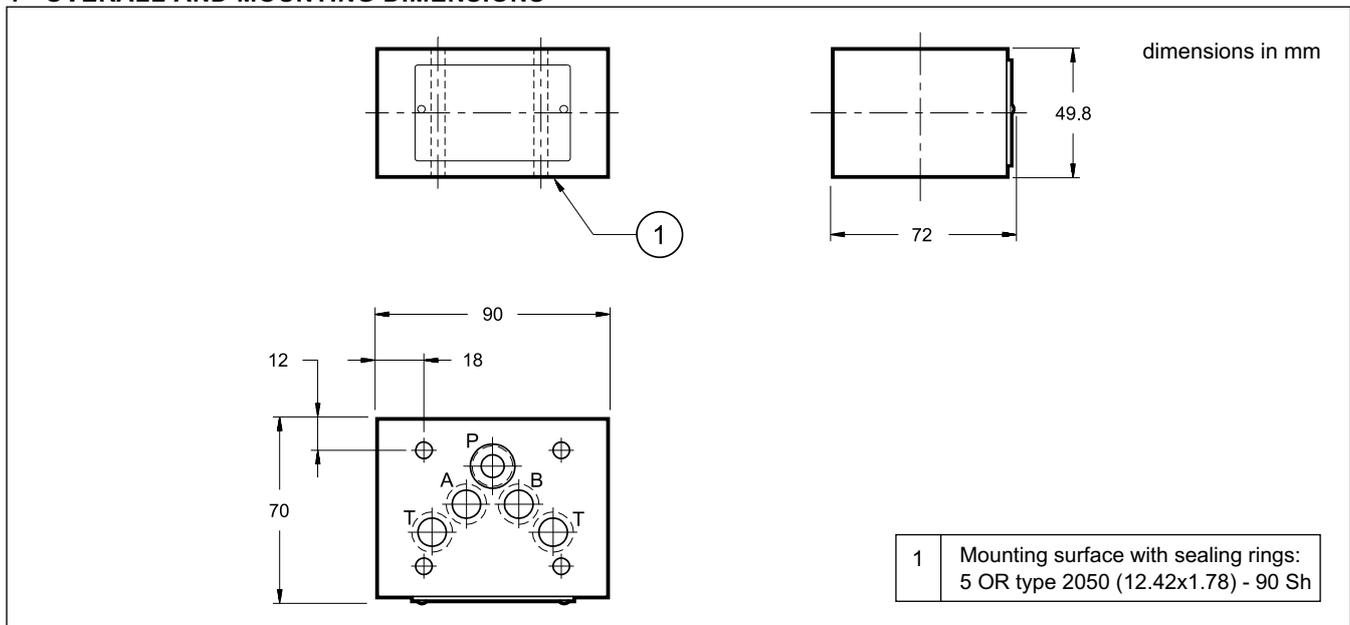
2) pressure drops on free lines (ex.  $A \rightarrow A_1$ )

**NOTE:** Add the valve cracking pressure to the values shown by the curve 1 of the diagram

### 3 - HYDRAULIC FLUIDS

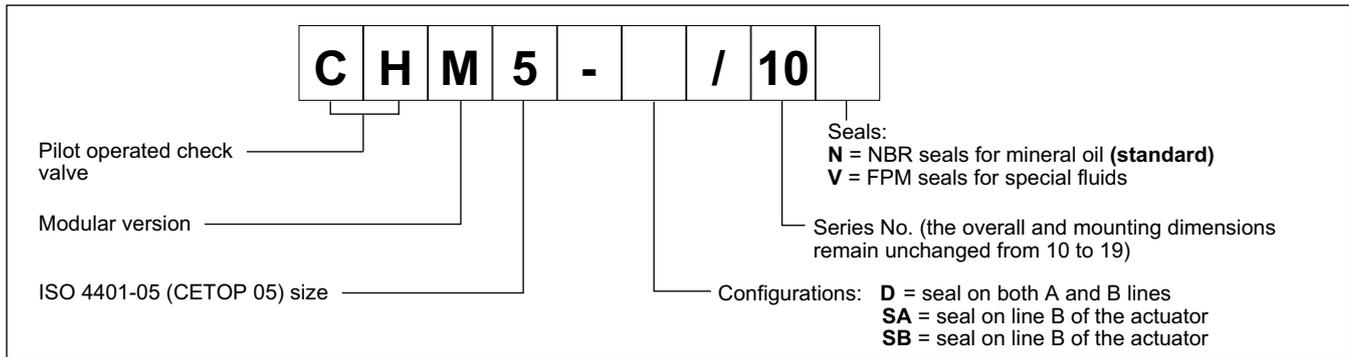
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures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

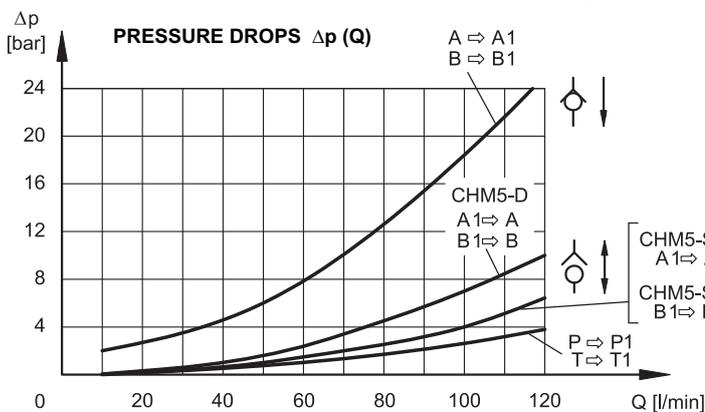




## 1 - IDENTIFICATION CODE



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



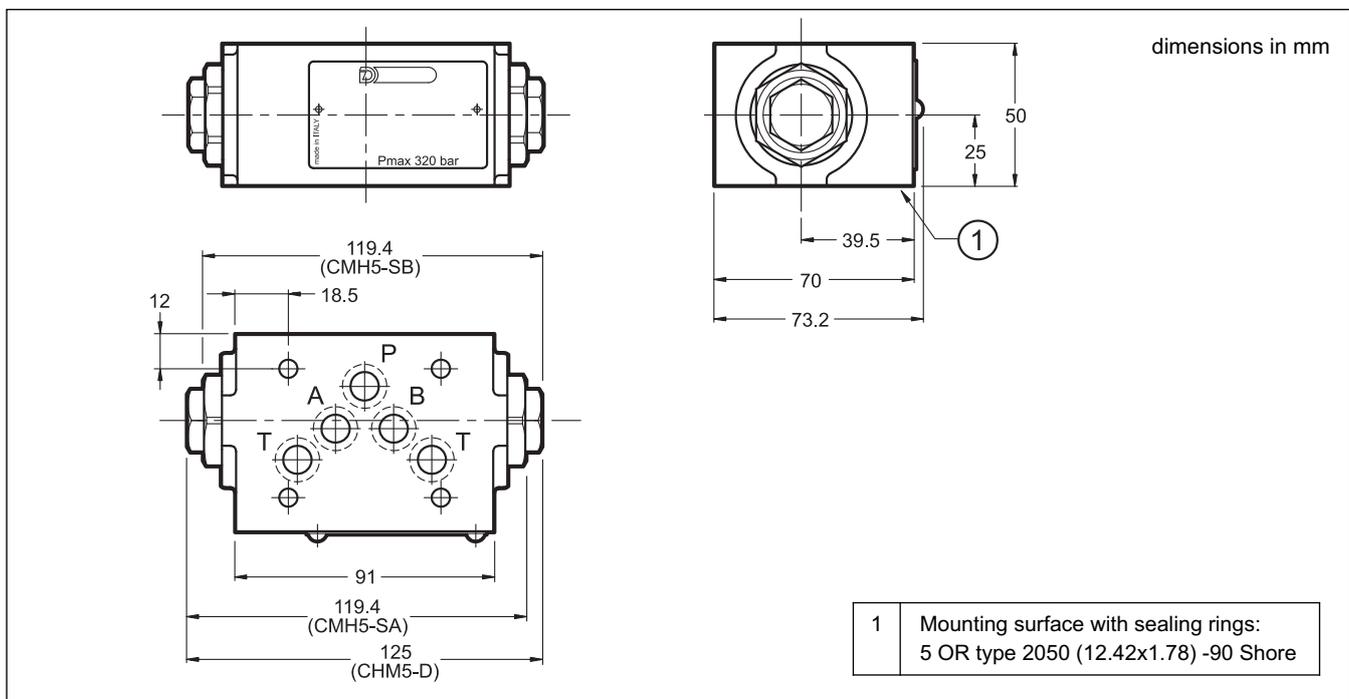
## 3 - HYDRAULIC FLUIDS

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.

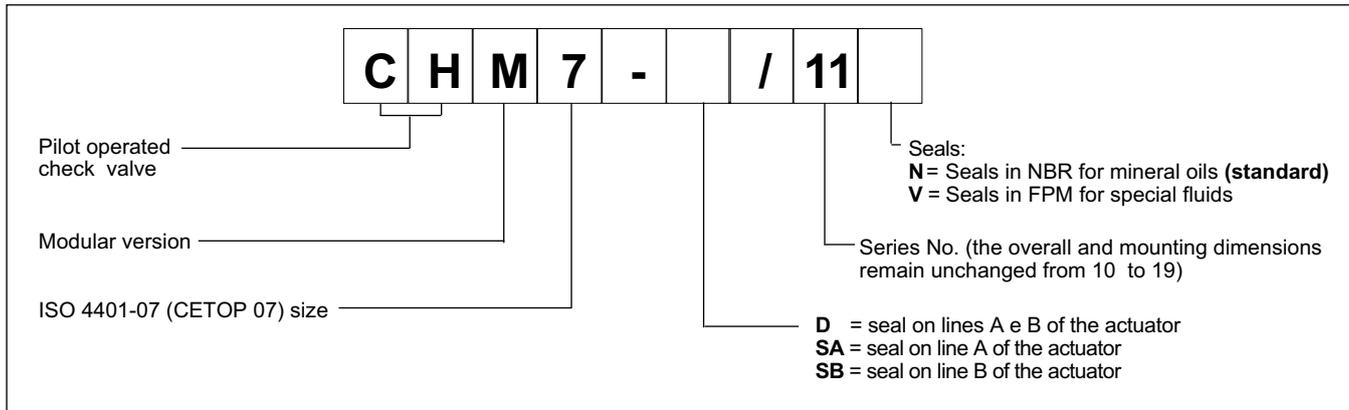
Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

## 4 - OVERALL AND MOUNTING DIMENSIONS



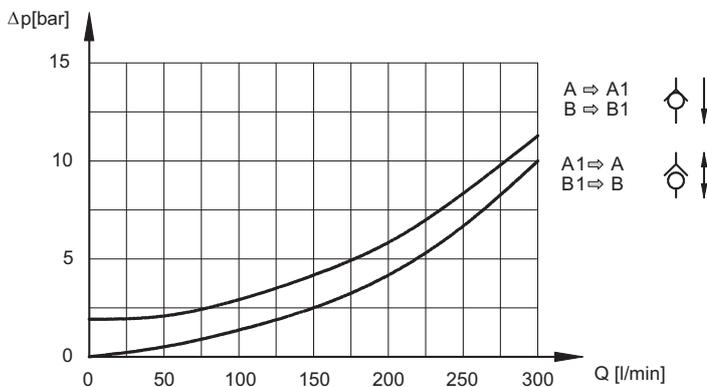


### 1 - IDENTIFICATION CODE



### 2 - CHARACTERISTIC CURVES

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



### 3 - HYDRAULIC FLUIDS

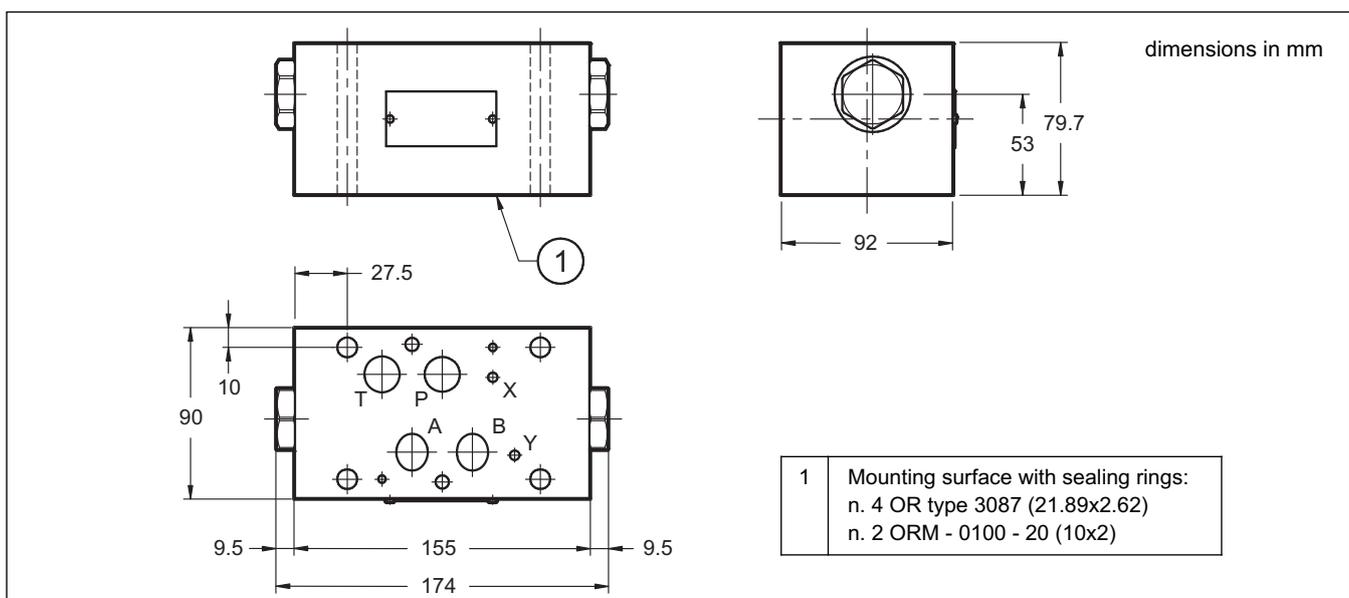
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. With this kind of fluids, use NBR seals type (code N). With HFDRfluids type (phosphate esters) use FPM seals (code V).

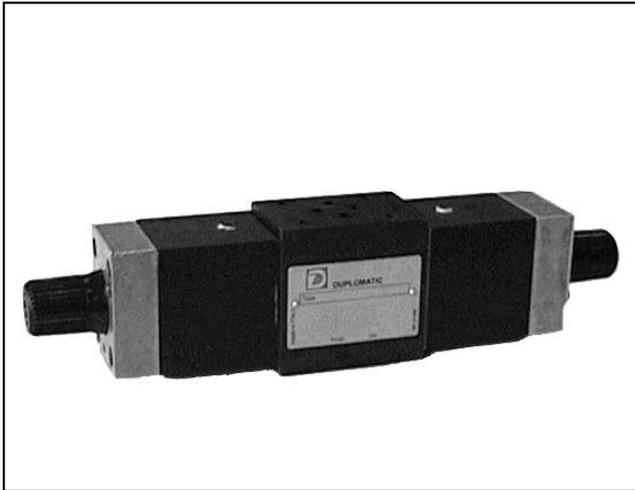
For the use of other fluid types such as HFA, HFB, HFC, please consult our technical department.

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

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

### 4 - OVERALL AND MOUNTING DIMENSIONS





# RPC1\*/M

## FLOW CONTROL VALVE

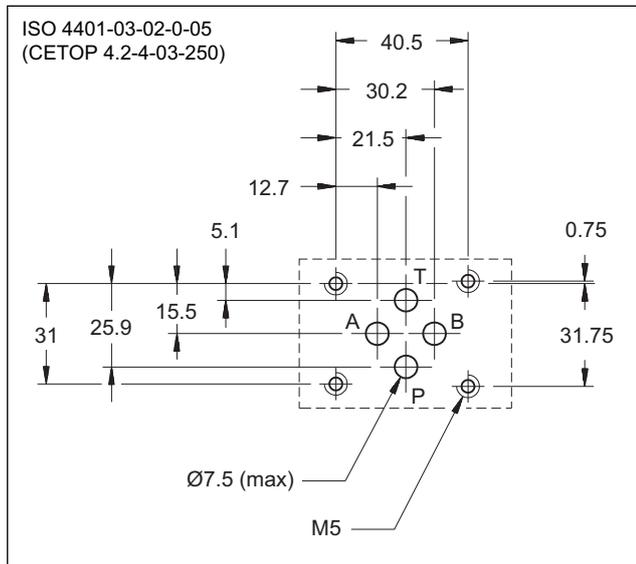
### SERIES 10

#### MODULAR VERSION

#### ISO 4401-03

**p** max 250 bar  
**Q** max (see table of performances)

#### MOUNTING INTERFACE



#### CONFIGURATIONS

(see hydraulic symbols table and identification code - par. 1)

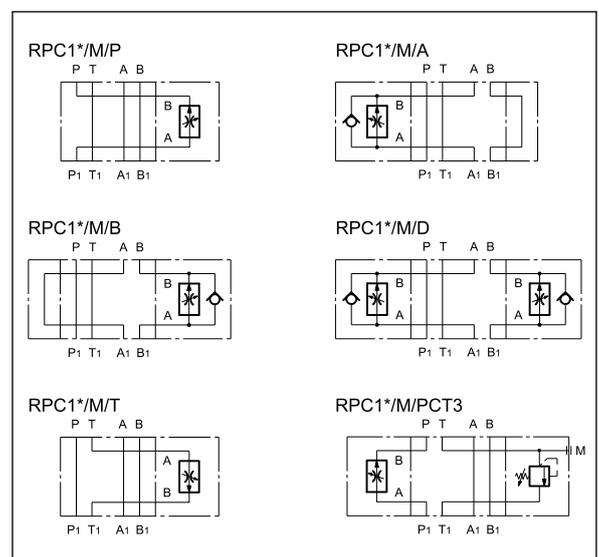
#### PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	250
Maximum flow rate in controlled lines	l/min	1-4-10-16-22-30
Maximum flow rate in the free lines		65
Reverse free flow maximum flowrate		40
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	3
RPC1-*/M/ A-B-T-P		4,1
RPC1-*/M/ D		3,7
RPC1-*/M/PCT3		
only modular block ISO 4401-03 without flow control valves:		
RPC1-K/M/*	1,5	
RPC1-K/M/PCT3	2,4	

#### OPERATING PRINCIPLE

- The RPC1\*/M valve is a flow control valve with pressure and temperature compensation, made as a modular version with mounting surface according to the ISO 4401 standards.
- It can be assembled quickly under the ISO 4401-03 directional solenoid valves and allows easy execution of hydraulic circuits where control of the speed of the actuators is required.
- It is available in six flow adjustment ranges up to 30 l/min.
- Combined with MDS3 type solenoid operated directional control valves (see cat. 41 251), it's possible to obtain circuits for the fast/slow control of the work actuators.

#### HYDRAULIC SYMBOLS



**NOTE:** for detailed information regarding the RPC1 flow control valve, see catalogue 32 200

### 1 - IDENTIFICATION CODE

<b>R</b>	<b>P</b>	<b>C</b>	<b>1</b>	<b>-</b>		<b>/</b>	<b>M</b>	<b>/</b>		<b>-</b>		<b>/</b>	<b>10</b>	<b>/</b>	
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Pressure and temperature compensated flow control valve

Flow adjustment range:  
**1** = 1 l/min      **16** = 16 l/min  
**4** = 4 l/min      **22** = 22 l/min  
**10** = 10 l/min    **30** = 30 l/min  
**K** = only ISO 4401-03 (CETOP 03) modular block supplied without flow control valve

Modular version \_\_\_\_\_  
size ISO 4401-03 (CETOP 03)

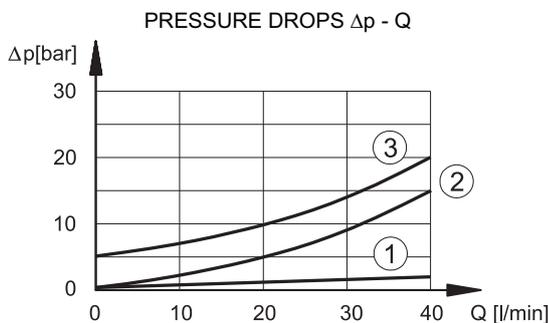
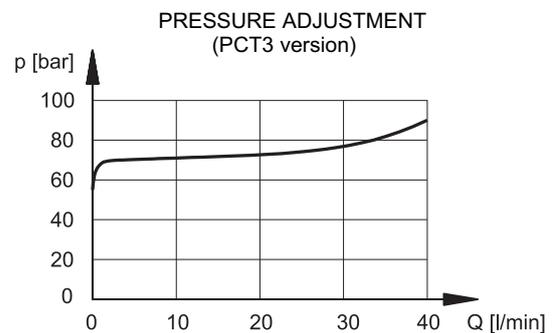
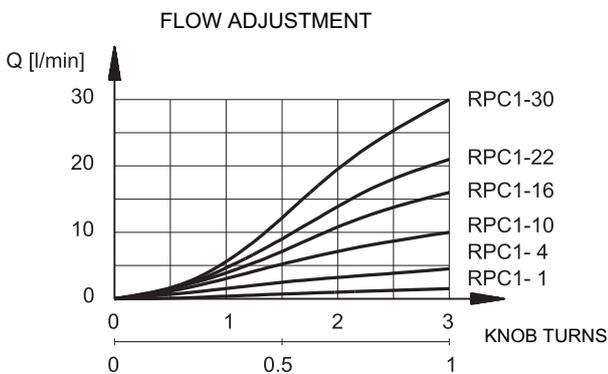
Seals: omit for mineral oils  
**V** = viton for special fluids

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

**M1** = adjustment knob only for PCT3 version (omit for adjustment with countersunk hex screw)

Configurations:  
**P** = meter in control on line P  
**A** = control from chamber A of the actuator  
**B** = control from chamber B of the actuator  
**D** = control from chambers A and B of the actuator  
**T** = meter out control on line T  
**PCT3** = meter in control on line P with backpressure adjustable on line T up to 70 bar  
(A and B configurations are not available in K version)

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



- 1) pressure drops on free lines
- 2) pressure drops through check valve
- 3) pressure drops through the backpressure valve (PCT3 version)

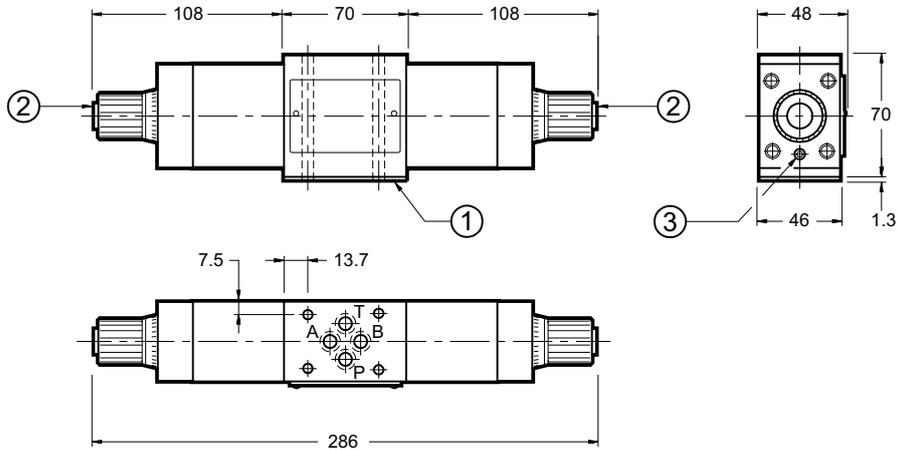
### 3 - HYDRAULIC FLUIDS

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.

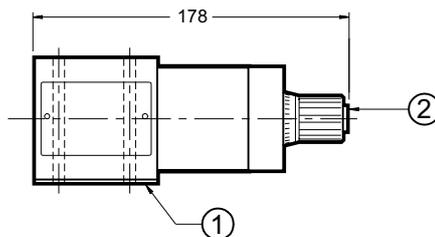
## 4 - OVERALL AND MOUNTING DIMENSIONS RPC1\*/M VALVES

dimensions in mm

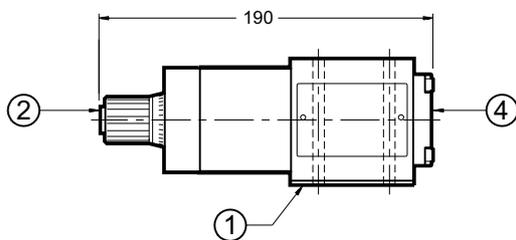
RPC1\*/M/D



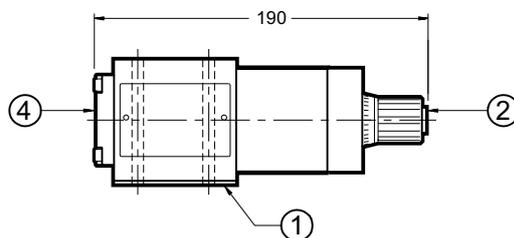
RPC1\*/M/P  
RPC1\*/M/T



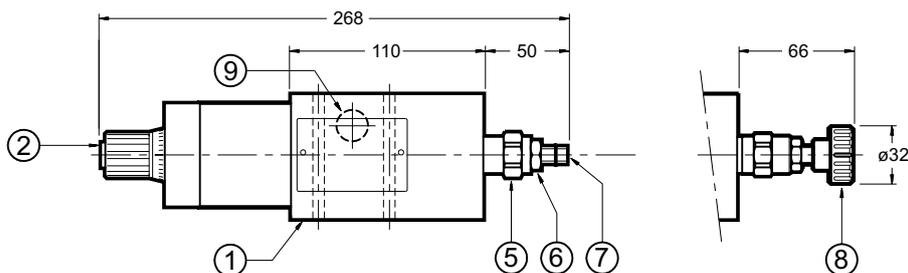
RPC1\*/M/A



RPC1\*/M/B



RPC1\*/M/PCT3



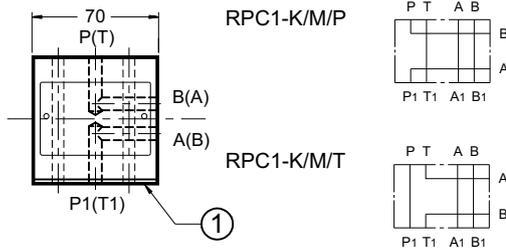
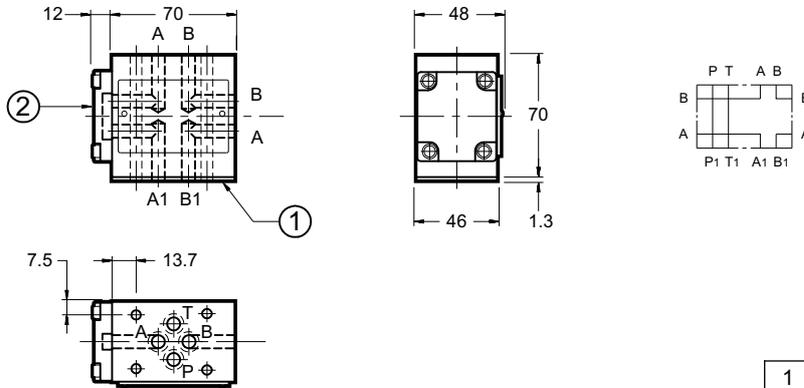
1	Mounting plate with sealing rings: P-OR1L/20N (NBR seals) P-OR1L/20V (Viton seals) For RPC1*/M/PCT3 without mounting plate: 4 OR 2037 (9.25x1.78) - 90 Shore
2	Flow adjustment knob (3 turns total) Rotate anticlockwise to increase flow.
3	Knob locking screw
4	Cross-connection cover
5	Backpressure valve on line T. Pressure adjustment range up to 70 bar
6	Locking nut: spanner 17
7	Countersunk hex screw: spanner 5 Rotate clockwise to increase pressure
8	Adjustment knob: <b>M1</b>
9	Pressure gauge port 1/4" BSP



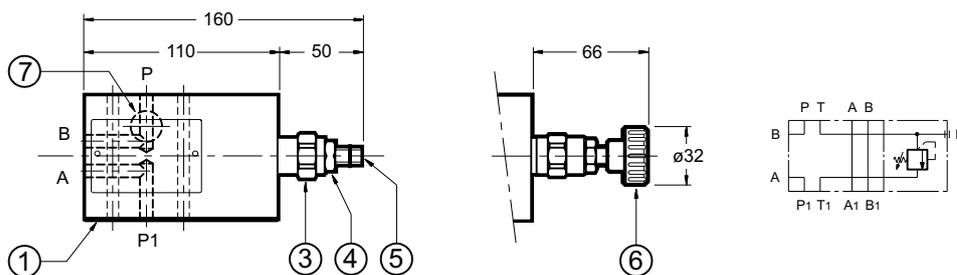
## 5 - OVERALL AND MOUNTING DIMENSIONS OF BLOCKS WITHOUT FLOW CONTROL VALVE

dimensions in mm

RPC1-K/M/D



RPC1-K/M/PCT3



1	Mounting plate with sealing rings: P-OR1L/20N (NBR seals) P-OR1L/20V (Viton seals) For RPC1-*/M/PCT3 without mounting plate: 4 OR 2037 (9.25x1.78) - 90 Shore
2	Cross-connection cover
3	Backpressure valve on line T. Pressure adjustment range up to 70 bar
4	Locking nut: spanner 17
5	Countersunk hex screw: spanner 5 Rotate clockwise to increase pressure
6	Adjustment knob: <b>M1</b>
7	Pressure gauge port 1/4" BSP



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 www.diplomatic.com • e-mail: sales.exp@diplomatic.com



# RLM3

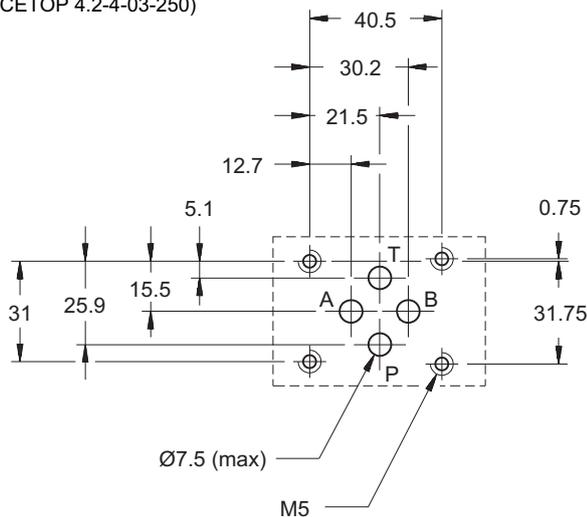
## ELECTRIC FAST / SLOW SPEED SELECTION VALVE SERIES 10

### MODULAR VERSION ISO 4401-03 (CETOP 03)

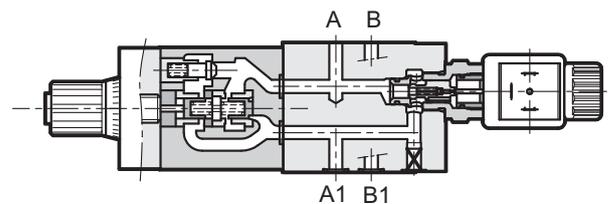
**p** max 250 bar  
**Q** max (see table of performances)

#### MOUNTING SURFACE

ISO 4401-03 -02-0-05  
(CETOP 4.2-4-03-250)



#### OPERATING PRINCIPLE



- The RLM3 valve is a compact group that allows control of the fast/slow flow through use of an open/close solenoid valve. The adjustment of the flow is carried out with the RPC1 compensated flow control valves (see catalogue 32 200) with six adjustment ranges.
- The fast/slow speed selection is obtained with the KT08 solenoid cartridge poppet valve (see catalogue 43100)
- Made as a modular version, the mounting surface is according to iso 4401 (CETOP RP121H) standards.
- The RLM3 valve can be assembled quickly under the ISO 4401-03 (CETOP 03) directional solenoid valves without use of pipes, permitting the construction of directional and speed controls for work actuators in a single mounting position.

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

Maximum operating pressure	bar	250
Maximum flow rate in controlled lines Maximum flow rate in the free lines	l/min	1 - 4 - 10 - 16 - 22 - 30 65
Minimum controlled flow rate	l/min	0,025
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	3,1

#### CONFIGURATIONS

(see Hydraulic symbols)

- Configuration "A": meter-out control from the actuator on chamber A.
- Configuration "T": control on discharge T of the directional solenoid valve for speed control in both directions of movement.

## 1 - IDENTIFICATION CODE

<b>R</b>	<b>L</b>	<b>M</b>	<b>3</b>	<b>-</b>		<b>/</b>	<b>10</b>	<b>-</b>		<b>/</b>	
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Electric fast/ slow speed selection valve

Modular version

Size ISO 4401-03 (CETOP 03)

Adjustments:  
**A** = adjustment on chamber A of the actuator;  
**T** = adjustment on discharge T of the directional solenoid valve

**A** = normally open solenoid valve  
**C** = normally closed solenoid valve

Flow adjustment range:  
**01** = 1 l/min      **16** = 16 l/min  
**04** = 4 l/min      **22** = 22 l/min  
**10** = 10 l/min     **30** = 30 l/min

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

See **NOTE 2**

Coil electrical connection (see paragraph 8)  
**K1** = plug for connector type DIN 43650 (**standard**)  
**K2** = plug for connector type AMP JUNIOR  
**K4** = outgoing cables  
**K7** = plug for connector type DEUTSCH DT04-2P male  
**K8** = plug for connector type AMP SUPER SEAL

Coil type:  
**D12** = 12 V } direct current (**standard**)  
**D24** = 24 V }  
**R110** = 110 V } rectified current  
**R230** = 230 V }  
**D00** = valve without coil (see **NOTE 1**))

Seals:  
**N** = NBR for mineral oils  
**V** = viton for special fluids

**NOTE 1:** The coil locking ring and the relevant seals are included in the supply.  
**NOTE 2:** The manual override **CM** is available as an option (see paragraph 8).

**N.B. :** For further informations about the flow control valve see catalogue 32 200; For further informations about the cartridge poppet valve see catalogue 43 100.

**NOTE:** The solenoid valves are never supplied with connector. Connectors must be ordered separately. To find out the type of connector to be ordered, please see catalogue 49 000.

### 1.1 - Coil identification code

<b>C14L3</b>	<b>-</b>				<b>/</b>	<b>10</b>
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Power supply

**D12** = 12 V } direct current  
**D24** = 24 V } (**standard**)  
**R110** = 110 V } rectified  
**R230** = 230 V } current

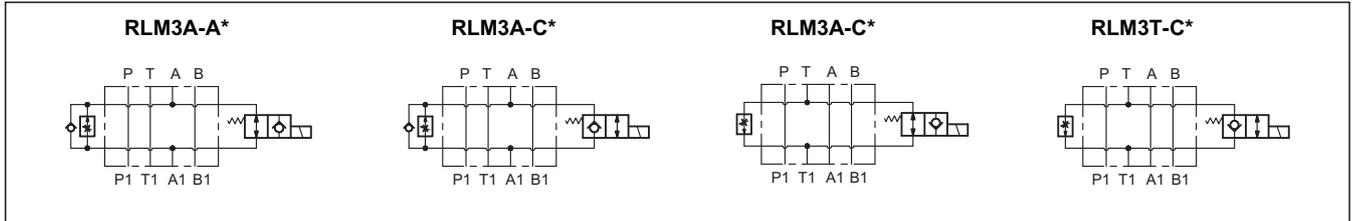
Series no.: (the overall and mounting dimensions remain unchanged from 10 to 19)

Coil electrical connection (see paragraph 10)  
**K1** = plug for connector type DIN 43650 (**standard**)  
**K2** = plug for connector type AMP JUNIOR  
**K4** = outgoing cables  
**K7** = plug for connector type DEUTSCH DT04-2P male  
**K8** = plug for connector type AMP SUPER SEAL

## 3 - HYDRAULIC FLUIDS

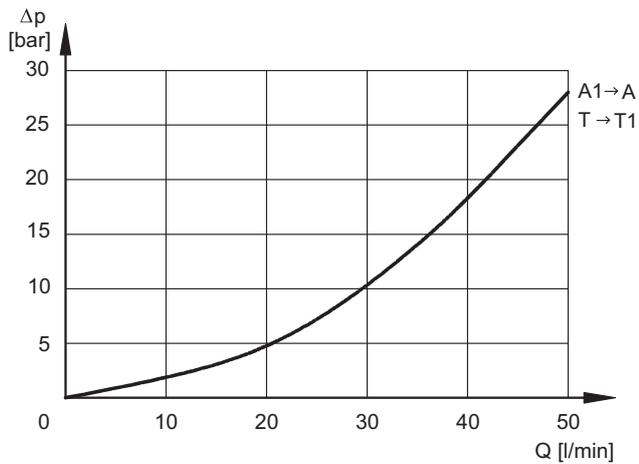
Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department. Using fluids at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

### 3 - HYDRAULIC SYMBOLS



### 4 - PRESSURE DROPS $\Delta p$ -Q

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



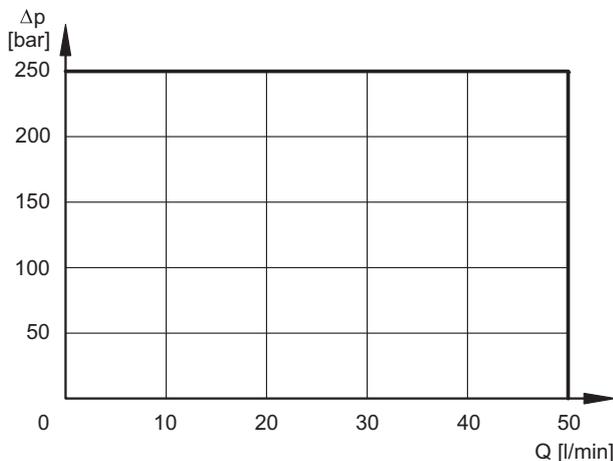
The values in graphs refer to the fast flow through the solenoid valve and are equal for A (normally open) and C (normally closed) versions.

### 5 - SWITCHING TIME

The values are obtained according to the ISO 6403 standard, with mineral oil at 50°C, with viscosity of 36 cSt.

TIMES [ms]	ENERGIZING	DE-ENERGIZING
<b>RLM3*-A*</b>	85	60
<b>RLM3*-C*</b>	60	85

### 6 - OPERATING LIMITS



The curves define the flow rate operating fields according to the valve pressure of the different versions.

The values have been obtained according to ISO 6403 norm with solenoids at rated temperature and supplied with voltage equal to 90% of the nominal voltage.

The value have been obtained with mineral oil, viscosity 36 cSt, temperature 50 °C and filtration according to ISO 4406:1999 class 18/16/13.

### 5 - ELECTRICAL FEATURES

#### 5.1 Solenoids

These are essentially made up of two parts: tube and coil. The tube is threaded onto the valve body and includes the armature that moves immersed in oil, without wear. The inner part, in contact with the oil in the return line, ensures heat dissipation. The coil is fastened to the tube by a threaded nut, and can be rotated according to the available space.

The interchangeability of coils of different voltages both D or R type is possible without removing the tube.

#### Protection according CEI EN 60529 - atmospheric agents

Connector	IP 65	IP 67	IP 69 K
K1 DIN 43650	x		
K2 AMP JUNIOR	x	x	
K4 outgoing cables	x	x	
K7 DEUTSCH DT04 male	x	x	x
K8 AMP SUPER SEAL	x	x	x

**NOTE:** The protection degree is guaranteed only with the connector correctly connected and installed.

<b>VOLTAGE SUPPLY FLUCTUATION</b>	± 10% Vnom
<b>MAX SWITCH ON FREQUENCY</b>	10.000 ins/hr
<b>DUTY CYCLE</b>	100%
<b>ELECTROMAGNETIC COMPATIBILITY (EMC) (NOTE 1)</b>	In compliance with 2004/108/CE
<b>LOW VOLTAGE</b>	In compliance with 2006/95/CE
<b>CLASS OF PROTECTION:</b> Atmospheric agents (CEI EN 60529) Coil insulation (VDE 0580) Impregnation:	IP 65 (NOTE 2) class H class H

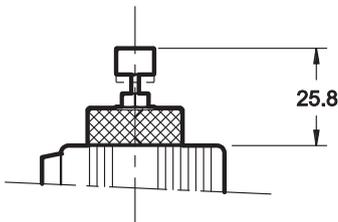
#### 5.2 Current and absorbed power

In the table are shown current and power consumption values relevant to the different coil types. "R" coil must be used when the valve is fed with AC power supply subsequently rectified by means of rectifier bridge, externally or incorporated in the "D" type connector (see cat. 49 000).

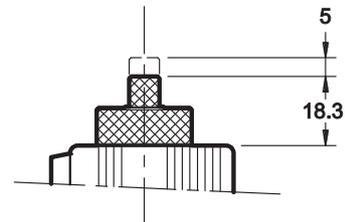
	Resistance at 20°C [Ω] (±1%)	Absorbed current [A] (±5%)	Absorbed power (±5%)		Coil code				
			[W]	[VA]	K1	K2	K4	K7	K8
<b>C14L3-D12*</b>	5,4	2,2	26,5		1902740	1902750	1902770	1902980	1903020
<b>C14L3-D24*</b>	20,7	1,16	27,8		1902741	1902751	1902771	1902981	1903021
<b>C14L3-R110*</b>	363	0,25		27,2	1902742				
<b>C14L3-R230*</b>	1640	0,11		26,4	1902743				

### 8 - MANUAL OVERRIDE

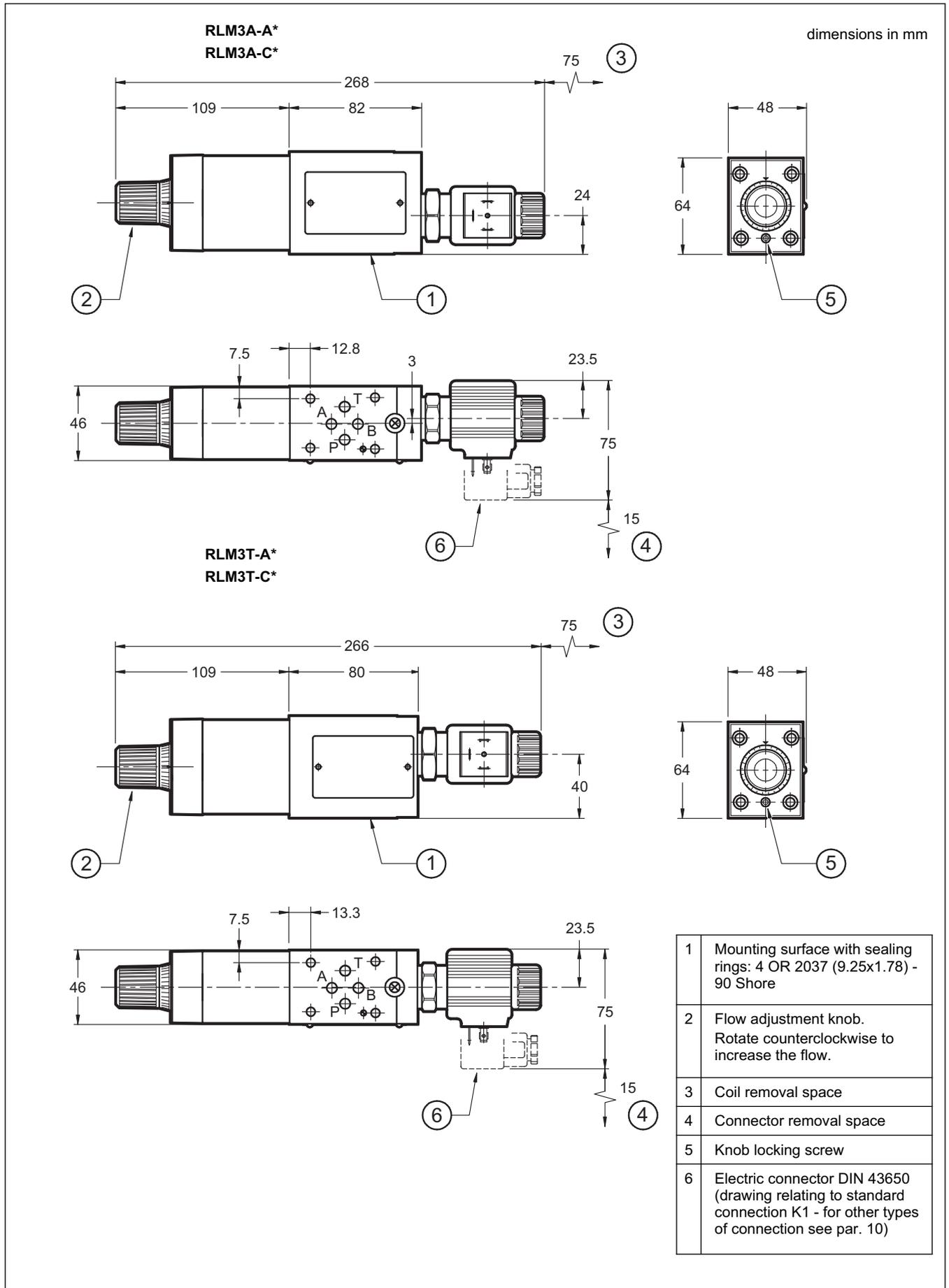
CM for NO version (pushing type)



CM for NC version (screw type)

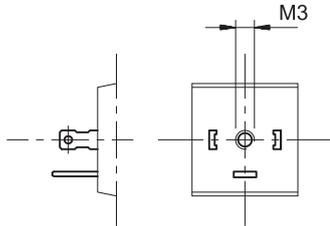


## 9 - OVERALL AND MOUNTING DIMENSIONS

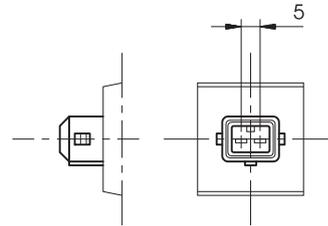


## 10 - ELECTRIC CONNECTIONS

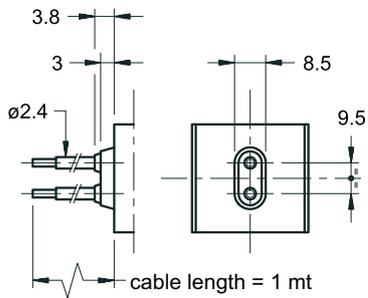
connection for DIN 43650 connector  
code **K1 (standard)**



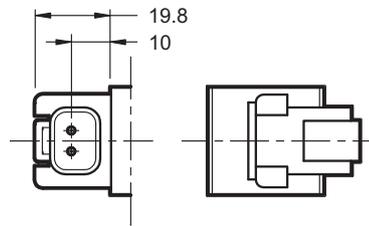
connection for AMP JUNIOR connector  
code **K2**



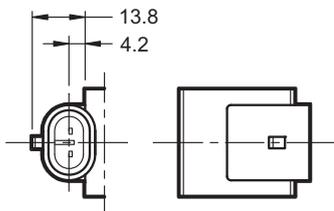
outgoing cables connection  
code **K4**



connection for DEUTSCH DT04-2P male connector  
code **K7**



connection for AMP SUPER SEAL connector (two contacts)  
code **K8**



## 11 - ELECTRIC CONNECTORS

The solenoid valves are supplied without connectors. For coils with standard electrical connections K1 type (DIN 43650) the connectors can be ordered separately. For the identification of the connector type to be ordered please see catalog 49 000. For K2, K7 and K8 connection type the relative connectors are not available.



# RPC1-\*/4M

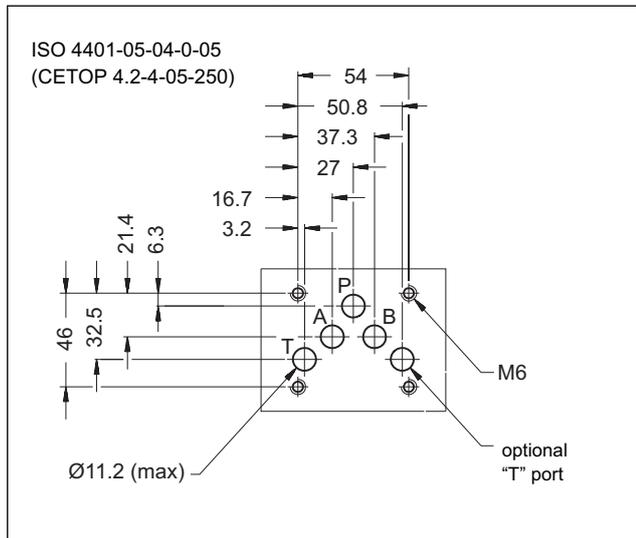
## FLOW CONTROL VALVE

### SERIES 10

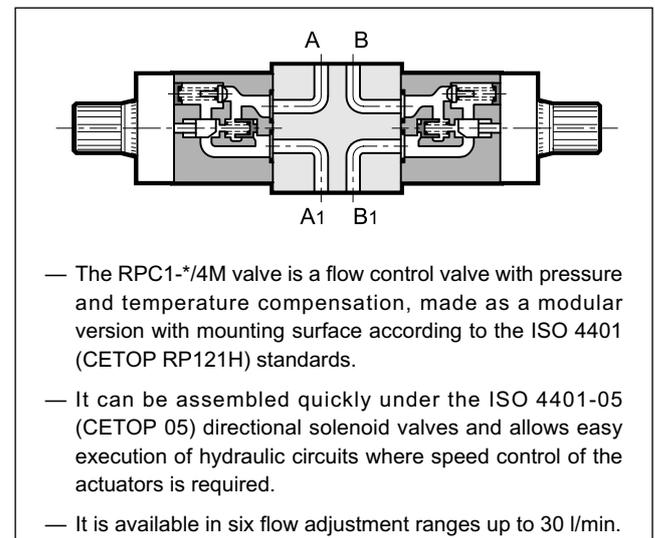
**MODULAR VERSION**  
**ISO 4401-05 (CETOP 05)**

**p** max **250** bar  
**Q** max (see table of performances)

#### MOUNTING INTERFACE



#### OPERATING PRINCIPLE

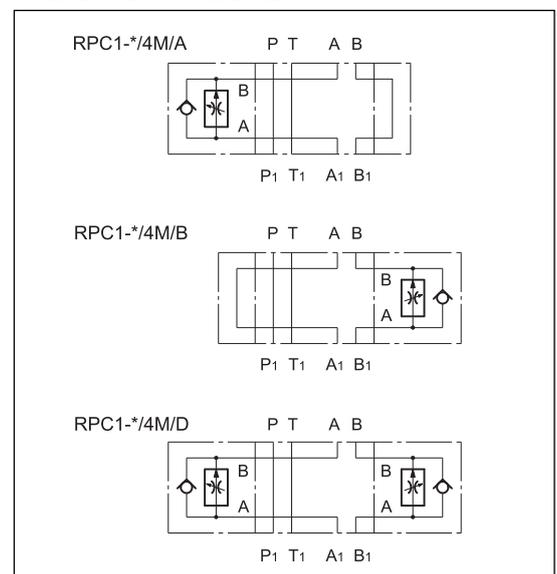


#### CONFIGURATIONS (see Hydraulic symbols table and Identification Code - par. 1)

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

Maximum operating pressure	bar	250
Maximum flow rate in controlled lines	l/min	1-4-10-16-22-30
Maximum flow rate in the free lines		100
Reverse free flow maximum flowrate		40
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: RPC1*/4M/ A-B	kg	4,3
RPC1*/4M/ D		5,6
only modular block ISO 4401-05 without flow control valves: RPC1-K/4M/D		3

#### HYDRAULIC SYMBOLS



**NOTE:** for detailed information regarding the RPC1 flow control valve, see catalogue 32 200.



# RPC1\*/4M

## SERIES 10

### 1 - IDENTIFICATION CODE

<b>R</b>	<b>P</b>	<b>C</b>	<b>1</b>	<b>-</b>	<b>/</b>	<b>4</b>	<b>M</b>	<b>/</b>	<b>/</b>	<b>10</b>	<b>/</b>	
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	-----------	----------	--

Pressure and temperature compensated flow control valve

Flow adjustment range:

<b>1</b> = 1 l/min	<b>16</b> = 16 l/min
<b>4</b> = 4 l/min	<b>22</b> = 22 l/min
<b>10</b> = 10 l/min	<b>30</b> = 30 l/min

**K** = only for ISO 4401-05 (CETOP 05) modular block supplied without flow control valves

Modular version \_\_\_\_\_  
ISO 4401-05 (CETOP 05) size

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

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

**A** = control from chamber A of the actuator  
**B** = control from chamber B of the actuator  
**D** = control from chambers A and B of the actuator  
(A and B configurations are not available in K version)

### 2 - HYDRAULIC FLUIDS

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

### 3 - OVERALL AND MOUNTING DIMENSIONS

dimensions in mm

1	Mounting surface with sealing rings: 5 OR type 2050 (12.42x1.78) - 90 Shore
2	Adjustment knob. Adjustment in 3 turns of the knob. Rotate anticlockwise to increase flow.
3	Knob locking screw
4	Side locking plate



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 Fax +39 0331.895.339  
 www.diplomatic.com • e-mail: sales.exp@diplomatic.com



# VSM3

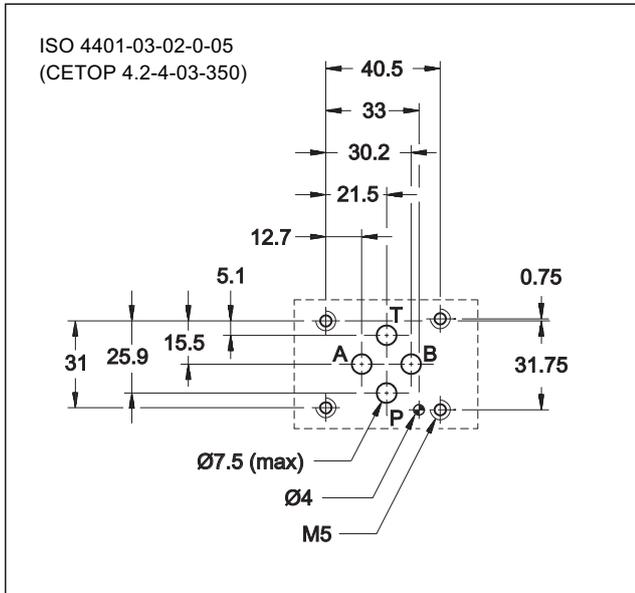
## SHUTTLE VALVE

### SERIES 10

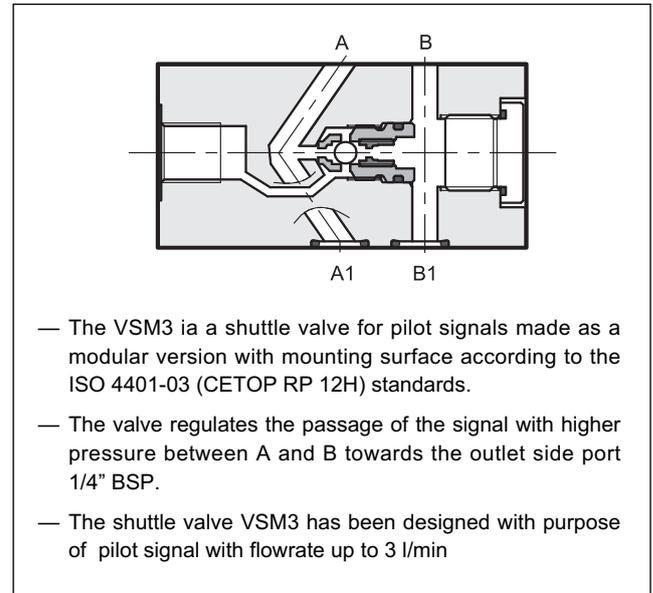
**MODULAR VERSION**  
**ISO 4401-03 (CETOP 03)**

**p max 350 bar**  
**Q max 40 l/min**

#### MOUNTING SURFACE



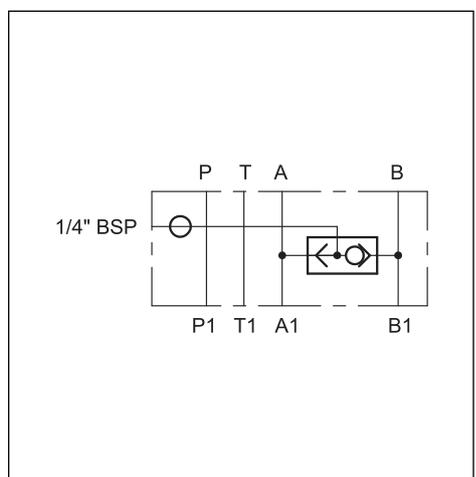
#### OPERATING PRINCIPLE



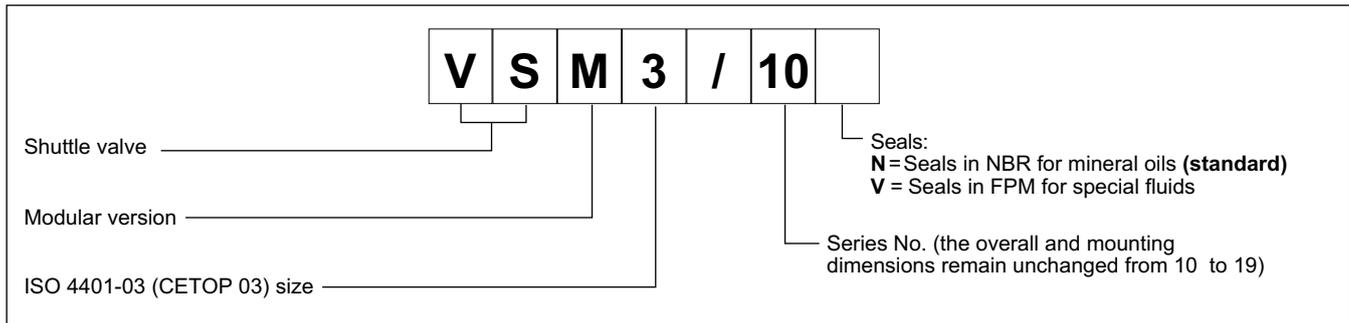
#### PERFORMANCES (measured with mineral oil of viscosity 36cSt at 50°C)

Maximum operating pressure	bar	350
Maximum flow rate through the cartridge	l/min	3
Maximum flow rate to A, B, P and T port	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 20/18/15	
Recommended viscosity	cSt	25
Mass	kg	0,95

#### HYDRAULIC SYMBOL

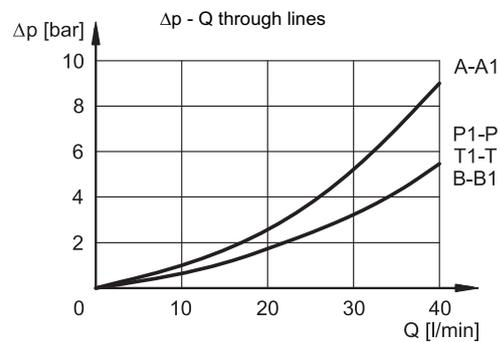
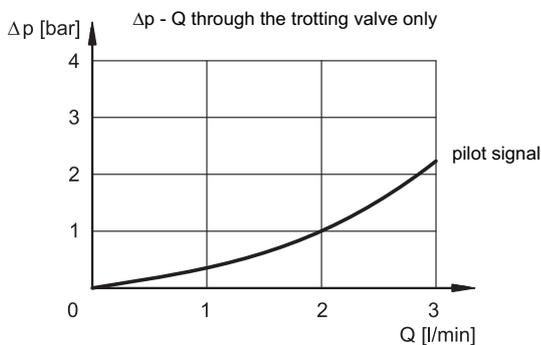


### 1 - IDENTIFICATION CODE



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

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



### 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

