

# Directional Valve Size 10 WL 4.10

Installation dimensions ISO 4401/DIN 24340 A10

## Functional Description

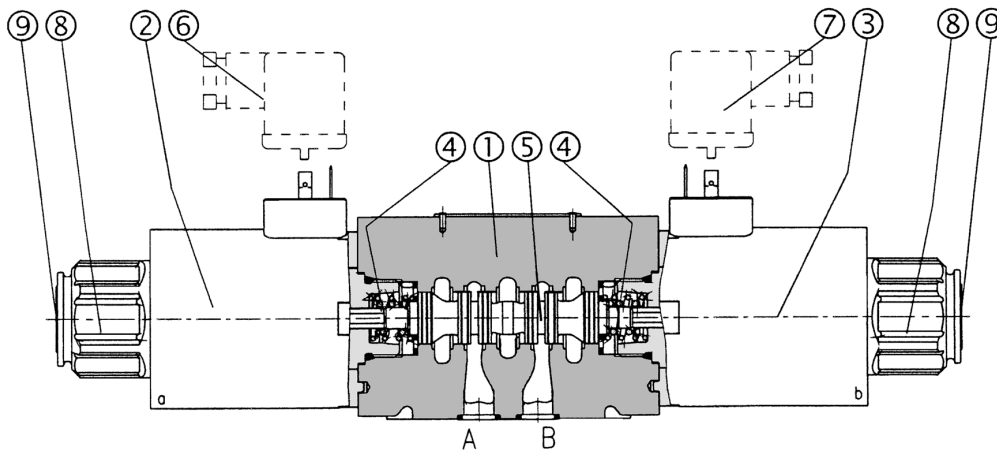
The directional control valves WL 4/10 consist of housing (1), control spool (5), centering springs (4) and operating solenoids (2, 3).

The three-position directional valves are fitted with two solenoids and two springs. The two-position directional valves have one solenoid and one return spring.

The operating solenoids are DC solenoids and are supplied through connectors A, B (6, 7) without rectifiers. For AC supply the solenoids are provided with rectifiers, which are integrated directly into the connectors A, B (6, 7). The connectors do not belong to delivery and must be ordered

separately. By loosening the fixing nut (8), the solenoid can be turned on its axis and fixed in three positions 90° apart. Provided that the pressure in T-port does not exceed 363 psi (25 bar), the spool of the valve can be repositioned by manual override (9).

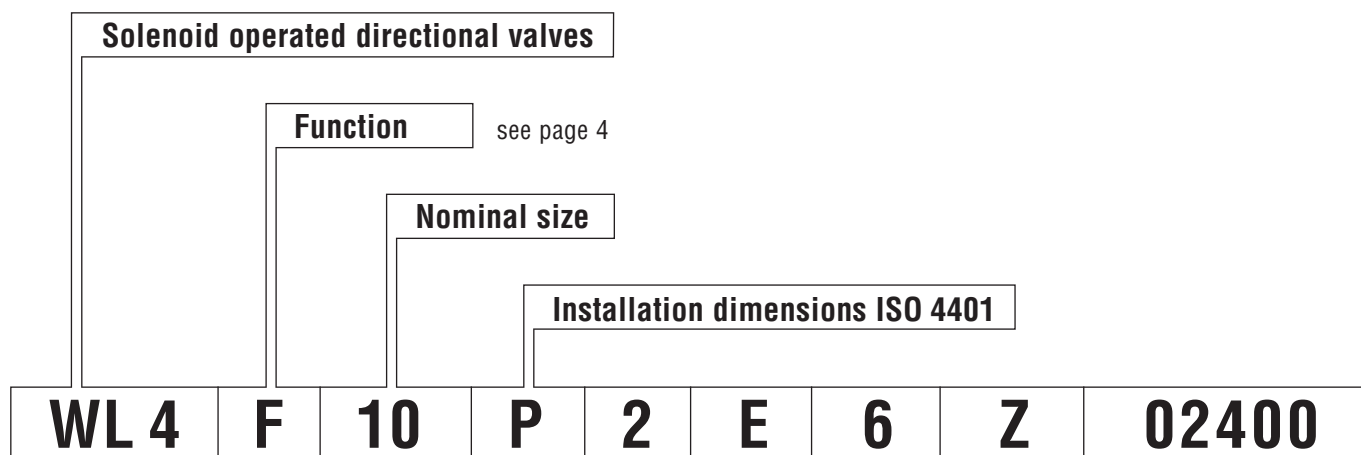
The basic surface treatment of the valve housing (1) is phosphate coated, whereas the operating solenoids (2, 3) are zinc coated.



## Technical Data

|  |   |   |  |
|--|---|---|--|
| Nominal size                             | 10  | Permissible rated voltage variation                                 | AC: ± 10 %<br>DC: ± 10 %               |
| Maximum flow                             | see p-Q characteristics   | Max. switching frequency  | 15000 1/h                              |
| Max. operating pressure at ports P, A, B | 5076 psi (350 bar)  | Switching time, on;<br>at $v = 166 \text{ SUS (35 mm}^2/\text{s)}$  | AC: 80 ... 330 ms<br>DC: 50 ... 120 ms |
| Max. operating pressure at port T        | 3045 psi (210 bar)  | Switching time, off;<br>at $v = 166 \text{ SUS (35 mm}^2/\text{s)}$ | AC: 100 ... 280 ms<br>DC: 30 ... 90 ms |
| Pressure losses                          | see $\Delta p$ -Q characteristics   | Duty cycle  | 100 %                                  |
| Hydraulic fluid                          | Hydraulic oils of DIN 51524/25<br>other Hydraulic fluids on request   | Service life  | $10^7$ cycles                          |
| Fluid temperature range (NBR)            | -22 ... +176 °F (-30 ... +80 °C)  | Enclosure type to DIN 40 050  | IP 65                                  |
| Fluid temperature range (FKM)            | - 4 ... +176 °F (-20 ... +80 °C)  | Weight-valve with 1 Solenoid  | 3.9 kg                                 |
| Ambient temperature max.                 | ... +122 °F (... +50 °C)  | valve with 2 Solenoids  | 5.4 kg                                 |
| Viscosity range                          | 98 ... 1840 SUS (20 ... 400 mm <sup>2</sup> /s)   | Mounting position   | optional                               |
| Maximum degree of fluid contamination    | Class 21/18/15 to ISO 4406.<br>Therefore we recommend a filter with a retention rate $\beta_{10} \geq 75$ . |   |  |

**Type Key**



**Ordering example**

**Internal special number**

**Solenoid**

**E** Coil for solenoid valve equipped with standard plug-in electrical connector acc. to DIN 43 650

**EG** Coil for solenoid valve with integrated rectifier equipped with standard plug-in electrical connector acc. to DIN 43 650

**Spring return**

see page 4

**Electric connection**

DIN 43 650, Protection IP 65, (DIN 40 050)

**Y** without electrical plug

**Z** with electrical plug (PG 11)

**L** with electrical plug and signal lights in conduit adapter (PG 11)

**Rated supply voltage of solenoids**

**01200** 12V DC / 3.17 A

**02400** 24V DC / 1.73 A

**12060** 120V AC / 0.35 A / 50 (60) Hz

**23050** 230V AC / 0.20 A / 50 (60) Hz

other voltages on request

Directional valves with damping on request:

T2 = nozzle Ø 0.6

T3 = throttle screw

Directional valves with manual override on request:

N2 = covered with rubber protective.

**Note**

Seal NBR (without marking)

OPTION FKM = V

Ordering example **V – WL4 F 10 P 2 E 6 Z 02400**

## Symbols

| Function  | Spring return | Symbol | Function | Spring return | Symbol | Function  | Spring return | Symbol |
|-----------|---------------|--------|----------|---------------|--------|-----------|---------------|--------|
| F ...6    |               |        | AP...0*  |               |        | F ...1    |               |        |
| EN...6 ** |               |        | AN...0** |               |        | BP...1 *  |               |        |
| SE...6    |               |        | U ...0   |               |        | BN...1 ** |               |        |
| KF...6    |               |        | KF...0   |               |        | EN...1 ** |               |        |
| SF...6    |               |        | SF...0   |               |        | SE...1    |               |        |
| AE...6    |               |        | EN...0** |               |        | F ...4    |               |        |
| HF...6    |               |        | F ...0   |               |        | AF...1    |               |        |
| FV...6    |               |        | F ...8   |               |        | HE...1    |               |        |
| HE...6    |               |        | SE...0   |               |        | F ...31   |               |        |
| AF...6    |               |        | AF...0   |               |        | AE...1    |               |        |
|           |               |        | AE...0   |               |        | HF...1    |               |        |
|           |               |        | HF...0   |               |        | SF...1    |               |        |

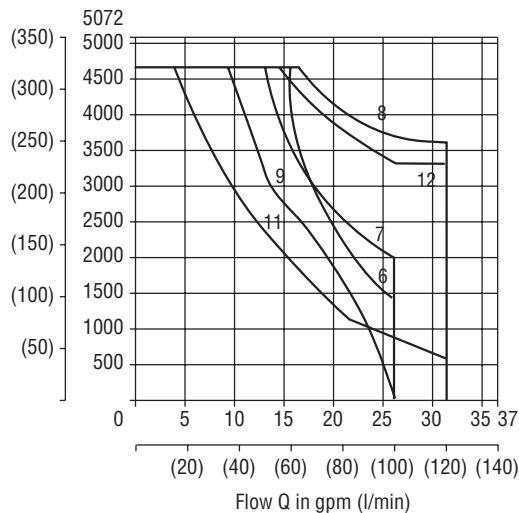
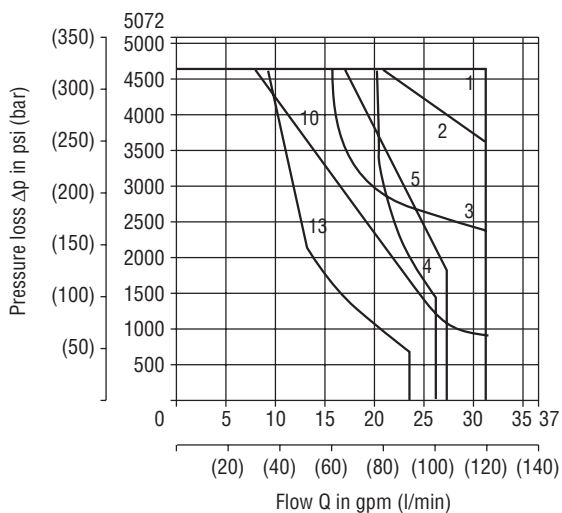
\* P  $\hat{=}$  Overlap (positive)  
 \*\* N  $\hat{=}$  Overlap (negative)

# Directional Valve Size 10 Installation dimensions ISO 4401 / DIN 24340 A10

## p-Q Characteristics Measured at $v = 166 \text{ SUS } (32 \text{ mm}^2/\text{s}^{-1})$ and $t = 104 \text{ }^\circ\text{F } (40 \text{ }^\circ\text{C})$

Operating limits for maximum hydraulic power transferred by the directional valve

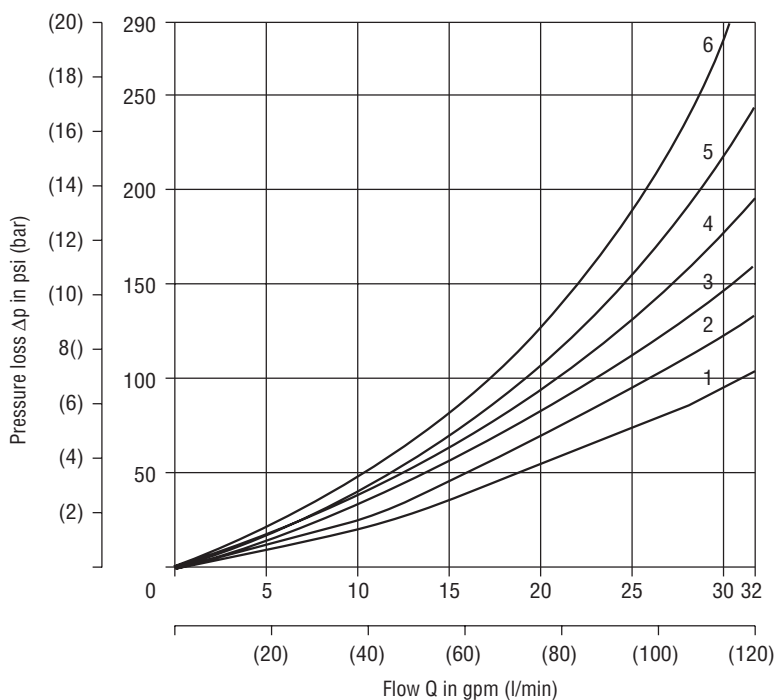
For respective spool type – see Functional Symbols



|         |   |
|---------|---|
| F ...6  | 1 |
| F ...0  | 1 |
| SE ...6 | 1 |
| SE ...0 | 1 |
| KF ...6 | 1 |
| KF ...0 | 1 |
| SF ...6 | 5 |
| SF ...0 | 5 |
| EN ...6 | 3 |
| EN ...0 | 3 |
| AP ...0 | 2 |
| BP ...1 | 2 |
| HF ...6 | 4 |
| HF ...0 | 4 |
| AE ...6 | 7 |
| AN ...0 | 2 |
| F ...31 | 6 |
| U ...0  | 8 |

## Δp-Q Characteristics Measured at $v = 166 \text{ SUS } (32 \text{ mm}^2/\text{s}^{-1})$ and $t = 104 \text{ }^\circ\text{F } (40 \text{ }^\circ\text{C})$

Pressure loss  $\Delta p$  related to flow rate

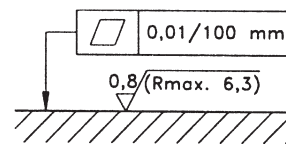
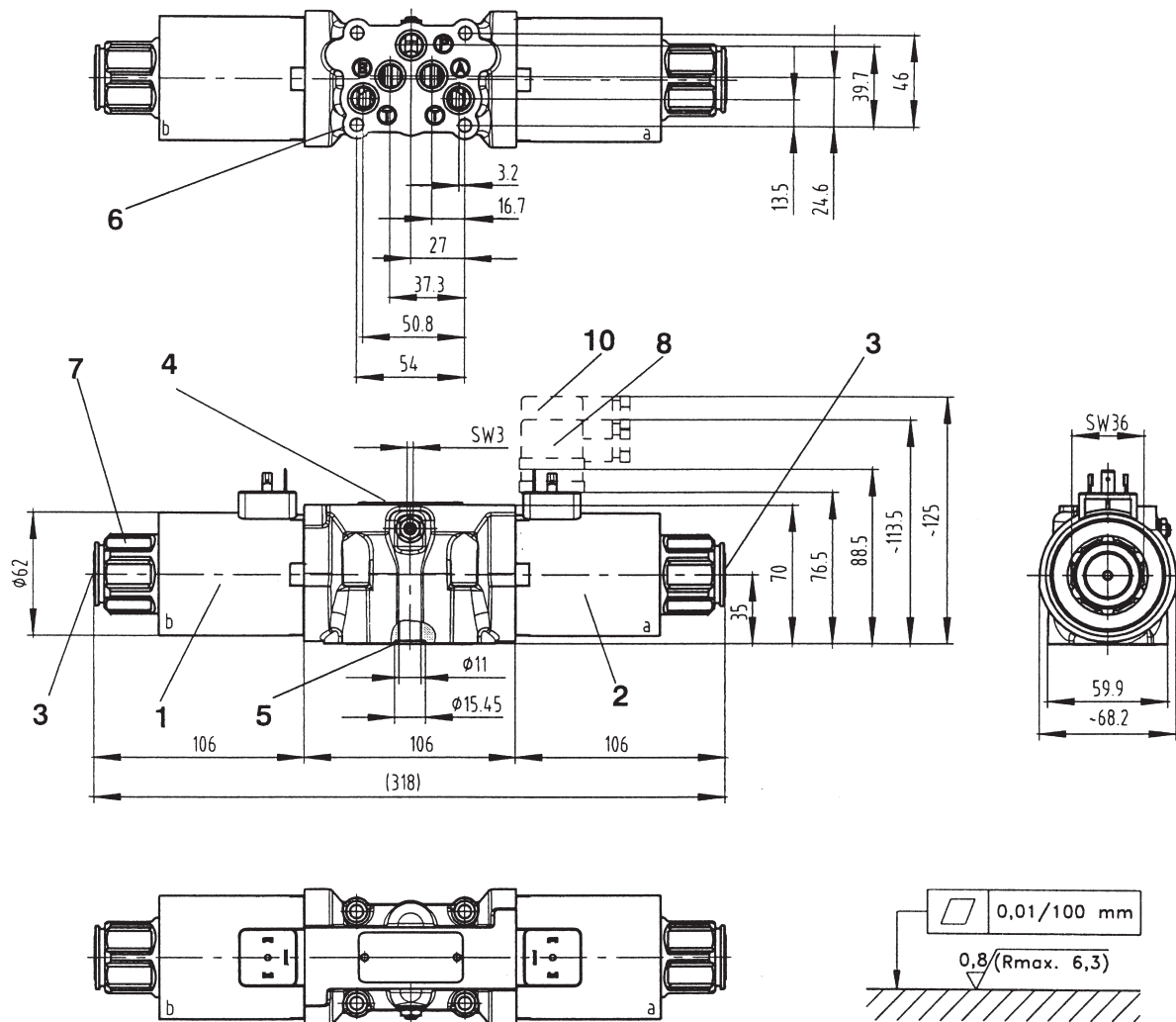


|         | P-A | P-B | A-T | B-T | P-T |
|---------|-----|-----|-----|-----|-----|
| F ...6  | 1   | 1   | 2   | 2   | -   |
| F ...0  | -   | 1   | 2   | -   | -   |
| SE ...6 | 1   | 1   | 2   | 2   | 1   |
| SE ...0 | -   | 1   | 2   | -   | 1   |
| KF ...6 | 1   | 1   | 2   | 2   | -   |
| KF ...0 | -   | 1   | 2   | -   | -   |
| SF ...6 | 1   | 1   | 2   | 2   | -   |
| SF ...0 | -   | 1   | 2   | -   | -   |
| EN ...6 | 4   | 3   | 4   | 5   | 1   |
| EN ...0 | 4   | -   | -   | 5   | 1   |
| AP ...0 | 1   | 1   | 2   | 2   | -   |
| BP ...1 | 1   | 1   | 2   | 2   | -   |
| HF ...6 | 1   | 1   | 2   | 2   | -   |
| HF ...0 | -   | 1   | 2   | -   | -   |
| AE ...6 | 1   | 1   | 1   | 2   | 2   |
| AN ...0 | 1   | 1   | 1   | 3   | -   |
| F ...31 | 1   | 1   | 2   | 3   | -   |
| U ...0  | 1   | 1   | -   | -   | -   |

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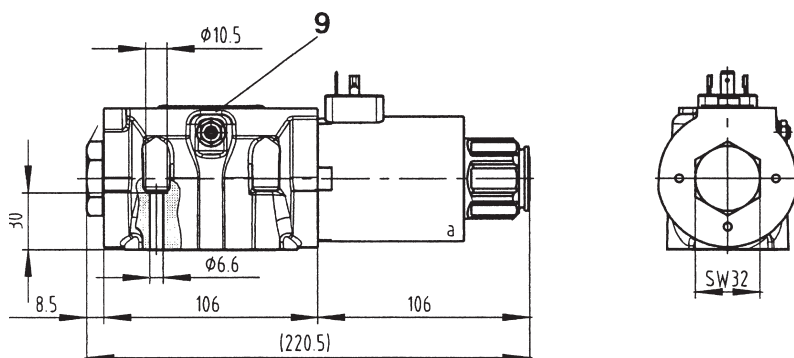
## Dimensions (Dimensions in inches and millimetres in brackets)

### Valve with two solenoids



Required surface finish to interface.

### Valve with one solenoid - a



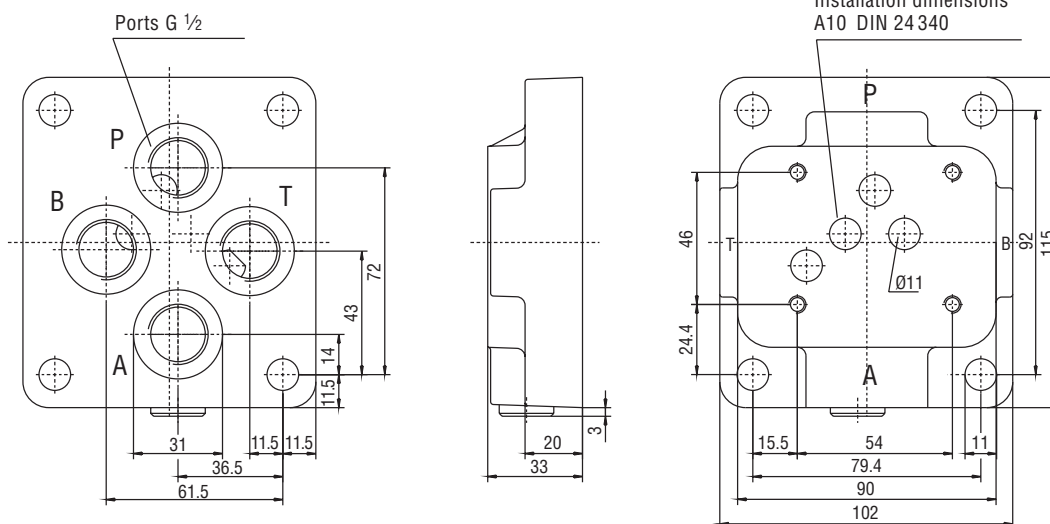
- 1 Solenoid a
- 2 Solenoid b
- 3 Manual override
- 4 Name plate
- 5 Square Ring 12.42 x 1.68 mm (5 pcs) supplied in delivery packet
- 6 4 mounting holes
- 7 Fixing nut of the solenoid
- 8 Connector plug to DIN 43 650
- 9 Distance required to remove plug
- 10 Throttle screw

Type Key

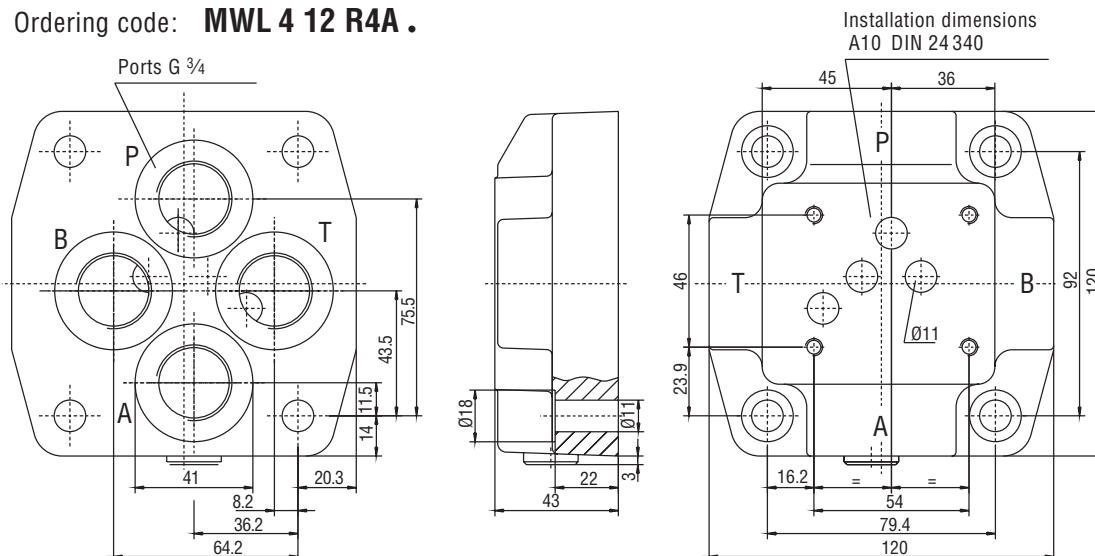
|              |           |                   |          |          |
|--------------|-----------|-------------------|----------|----------|
| Nominal size |           | Construction code |          |          |
| <b>MWL 4</b> |           | <b>R</b>          | <b>A</b> | <b>.</b> |
| Ports G 1/2  | <b>10</b> | <b>3</b>          | Code no. |          |
| Ports G 3/4  | <b>12</b> | <b>4</b>          |          |          |

|          |                  |
|----------|------------------|
| <b>0</b> | All 4 ports open |
| <b>1</b> | Port A closed    |
| <b>2</b> | Port B closed    |
| <b>3</b> | Port P closed    |
| <b>4</b> | Ports A+B closed |
| <b>5</b> | Ports B+P closed |
| <b>6</b> | Ports A+P closed |
| <b>7</b> | Ports A+T closed |
| <b>8</b> | Ports B+T closed |
| <b>9</b> | Port T closed    |

Ordering code: **MWL 4 12 R4A .**



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WL4.10/e/10.06