**RE 64 623/03.99**

Replaces: 03.98

engineering mannesmann Rexroth

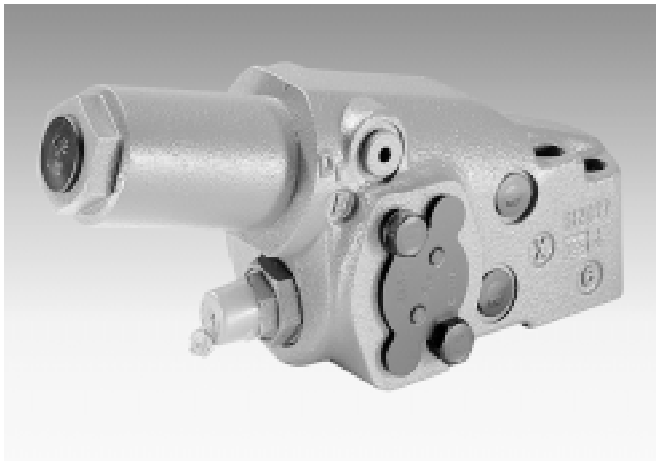
# Pipe burst safety valve
# Type MHRB

Nominals sizes 16 and 22

Series 3X

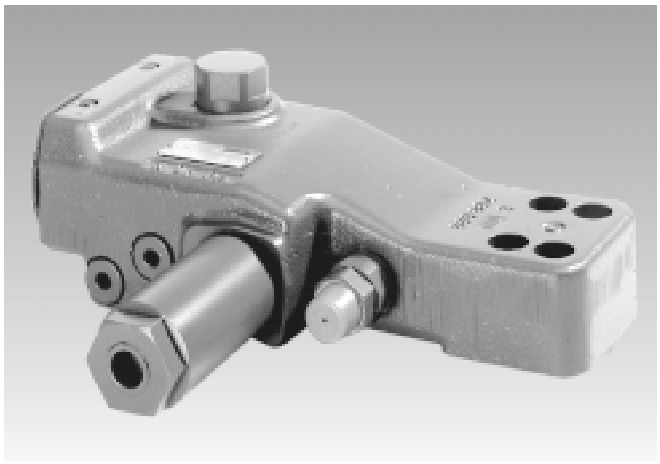
Maximum operating pressure 350 bar

Maximum flow: • NS 16 200 L/min
• NS 22 400 L/min



H/A/D5904/98

Type MHRB 22 F**GA**3X/.....



H/A5346/96

Type MHRB 22 F**GT**3X/.....

## Overview of contents



## Features

- Can be directly mounted onto a cylinder with an SAE porting pattern
- The velocity increase caused by a hose break, < 10% of the initial velocity
- No lowering of the load in the neutral position - leak-free version.
- Very good, even fine control characteristics in any cylinder position
- No increase in working cycle times when MHRB valves are fitted. Machine data in unchanged.
- The MHRB valves can be easily rectro fitted, the directional valve control characteristic curves have to be stated.
- No changes are required to the directional valve
- Performance losses, $\Delta p$ values during the lifting process are minimised

## Ordering details GA

| MHRB | | | GA | 3X/ | D | | | V | 18 | * |
|---|---|---|---|---|---|---|---|---|---|---|

**Nominal size**
Size 16 (on request) **= 16**
Size 22 **= 22**

**Version**
Leak-free version **= F**
Leak-free version, load compensated (on request) **= L**

**Design**
Standard version **= GA**

**Series**
Series 30 to 39 **= 3X**
(30 to 39: unchanged installation and connection dimensions)

**Housing version**
Standard housing, symetrical **= D**
(other versions on request)

**Characteristic curves**
Are factory defined, **= XXXX [1)]**
The control characteristic curves of the control blocks/directional valves which are fitted are required

Further details in clear text

**Connection type**
(further types of connection on request)
**18 =** SAE 1“ port
(for unit dimensions see page 7)

**Seals**
**V =** FPM seals, suitable for minerail oil (HL,HLP) to DIN 51 524 and phosphate ester (HFD-R)

**Pressure settings**
**No code =** Standard, 350 bar
**... =** Customer specific settings (e.g. 300 bar = 300)

[1)] In the case of an order, exact details regarding the control blocks/directional valves that are to be used as well as the pilot characteristic curves and the flow cross-section A from actuator to tank is to be stated as a function of the pilot pressure Pp.

## Ordering details GT/GS

| MHRB | | | | 3X/ | | | | V | | * |
|---|---|---|---|---|---|---|---|---|---|---|

**Nominal size**
Size 16 (only version ..GT..) **= 16**
Size 22 **= 22**
Size 32 (on request) **= 32**

**Version**
Leak-free version **= F**
Load compensated version (only version ..GT..) **= L**

**Design**
With a separate tank connection **= GT**
With a separate tank connection (Size 22) **= GS**
Connection Pp offset through 90°, see unit dimensions on page 12 (version MHRB 22..R..)

**Series**
Series 30 to 39 **= 3X**
(30 to 39: unchanged installation and connection dimensions)

**Housing version**
Single connection left **= L**
Single connection right **= R**

[1)] In the case of an order, exact details regarding the control blocks/directional valves that are to be used as well as the pilot characteristic curves and the flow cross-section A from actuator to tank is to be stated as a function of the pilot pressure Pp.

Further details in clear text

**Connection type**
(further types of connection on request)

**Size 16**
**53 =** SAE 3/4“ port

**Size 22**
**18 =** SAE 1“ port
**42K =** SAE 1“ port
**42 =** SAE 1“ port
**49 =** SAE 3/4“ port
**51 =** SAE 1 1/4“ port
(for unit dimensions see pages 8 to12)

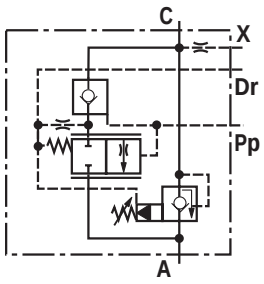
**Seals**
**V =** FPM seals, suitable for mineral oil (HL,HLP) to DIN 51 524 and phosphate ester (HFD-R)

**Pressure settings**
**No code =** Standard, 350 bar
**... =** Customer specific settings (e.g. 300 bar = 300)

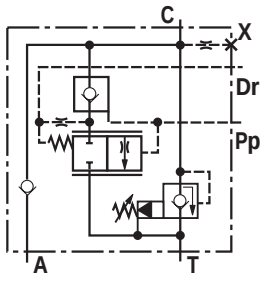
**XXXX [1)] =** Are factory defined, The control characteristic curves of the control blocks/directional valves are required

## Symbols

Variant: **GA**




Variant: **GT/GS**




## Function, section

### Design

The valve basically comprises of:

- Housing (1)
- Main spool with leak-free closure (2)
- Control springs (3)
- Secondary pressure relief valve (4)

### Connections

- Feed port (A)
- Cylinder port (C)
- Pilot port (Pp)
- Drain port (Dr)
- Test point (X)

### Function

Flow direction from A to C

- The fluid flows over the pressure relief valve (4) to port C.

Flow direction from von C to A

- The leak-free closure (2) is released via the pilot pressure (Pp).

  With an increase in the pilot pressure (Pp) the main spool is proportionaly pushed against the control spring (3) and the opening cross-section is proportinaly increased.

### Over-load warnings, equalisation line

The test point (X) is used for test purposes or to connect an over-load pressure switch.

For parallel operation as a connection for the pressure equalisation line.

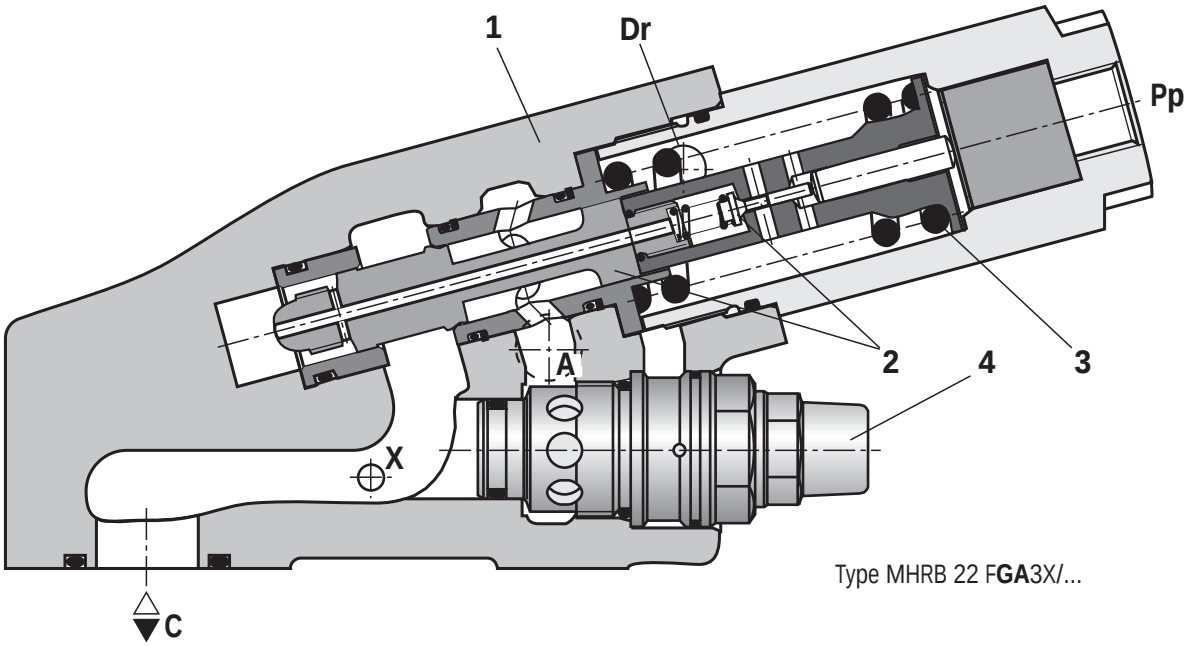
### Pipework

Required sizes:

- Length < 3 m = pipe 12 x 1.5 = ID 9
- Length > 3 m = pipe 15 x 1.5 = ID 12

### Regulations (DIN/ISO 8643)

Excavators and excavator loaders (maschines), that are to preform lifting operations must be fitted with pipe burst safety valves.




Type MHRB 22 F**GA**3X/...

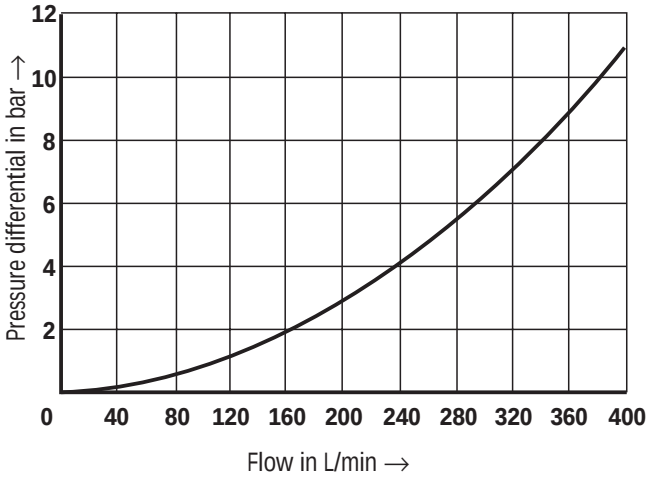
## **Technical data** (for applications outside these parameters, please consult us!)

General / Hydraulic technical data

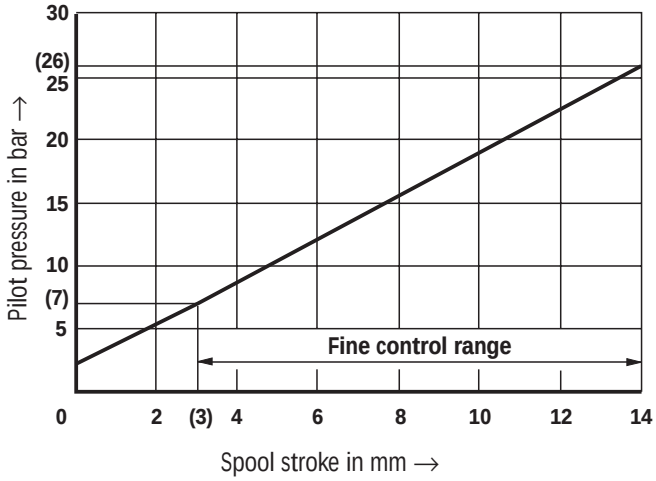
| | | | | | |
|---|---|---|---|---|---|
| Pressure fluid | | | Mineral oil (HL, HLP) to DIN 51 524;<br>Fast bio.degradable pressure fluids to<br>VDMA 24568 (also see RE 90 221); HETG (rape seed oil;<br>HEPG (polyglycole); HEES (synthetic ester;<br>other pressure fluids on request | | |
| Pressure fluid temperature range | | °C | – 20 to + 80 | | |
| Viscosity range | | $mm^2/s$ | 10 to 380 | | |
| Degree of fluid contamination | | | Maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 9. We, therefore, recommend a filter with a minimum retention rate of $ß_{10} \geq 75$. | | |
| Maximum operating pressure | | bar | 350 | | |
| Peak pressure | at port A | bar | 420 (6000 PSI) | | |
| | at port T | bar | 210 (3000 PSI) | | |
| Pilot pressure | | bar | see characteristic curves on page 5 | | |
| Maximum flow | | L/min | Type | | |
| | | | GA | GT | GS |
| | | Size 16 | – | 200 | – |
| | | Size 22 | 400 | 400 | 400 |
| Weight | | kg | | | |
| | | Size 16 | – | approx.12 | – |
| | | Size 22 | approx.9,5 | approx.15 | approx.15 |

## Characteristic curves (measured at $\nu$ = 41 mm²/s and $\vartheta$ = 50 °C)

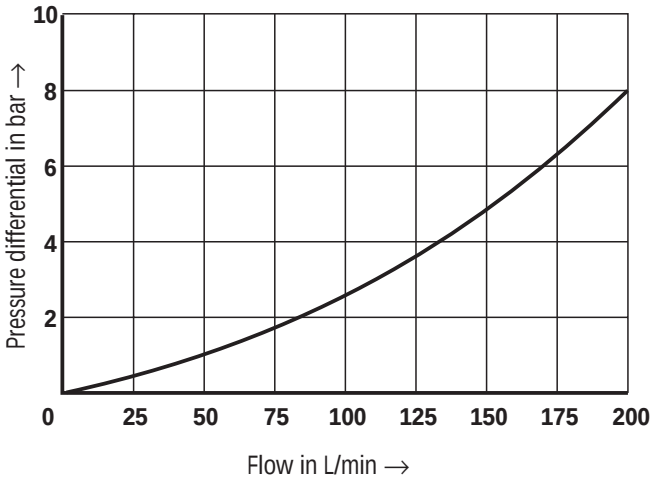
### Type GA 22



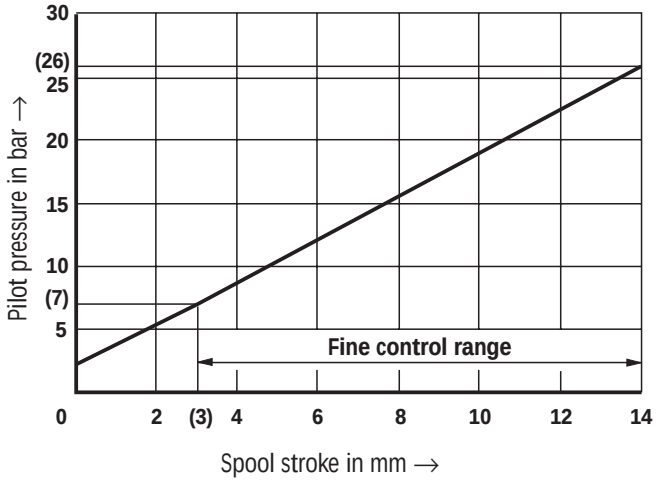

### Control characteristic curve *Pp = f (s)*



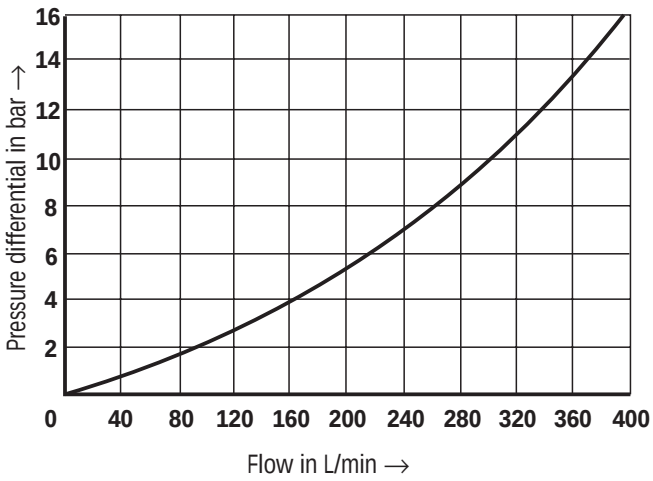

### Type GT 16



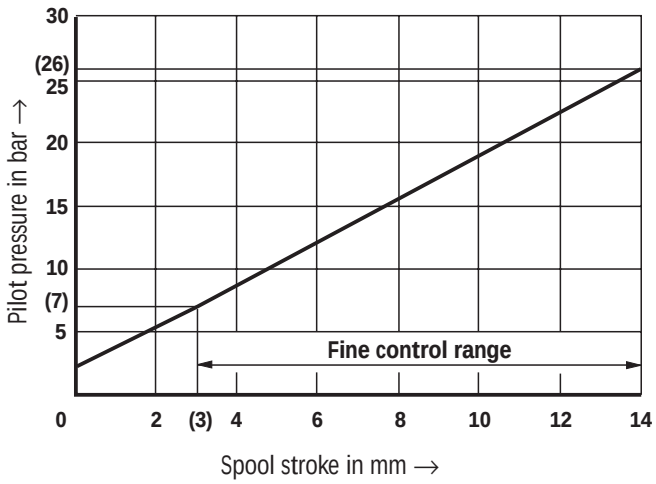

### Control characteristic curve *Pp = f (s)*



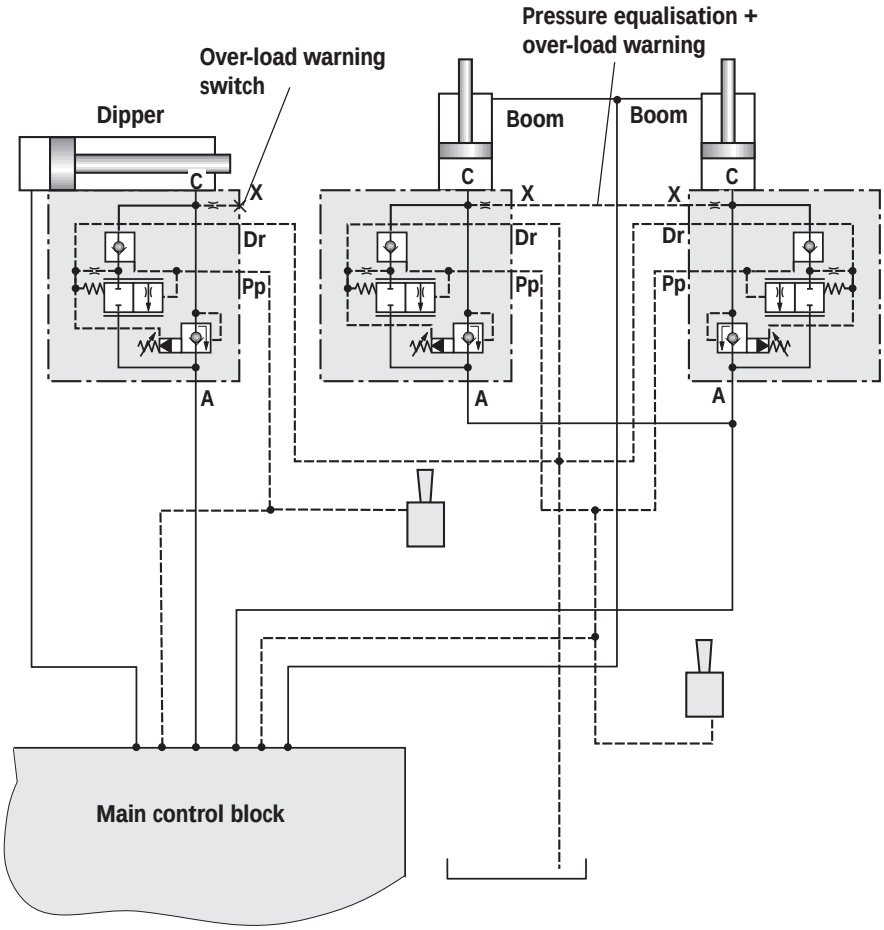

### Types GT 22 and GS 22



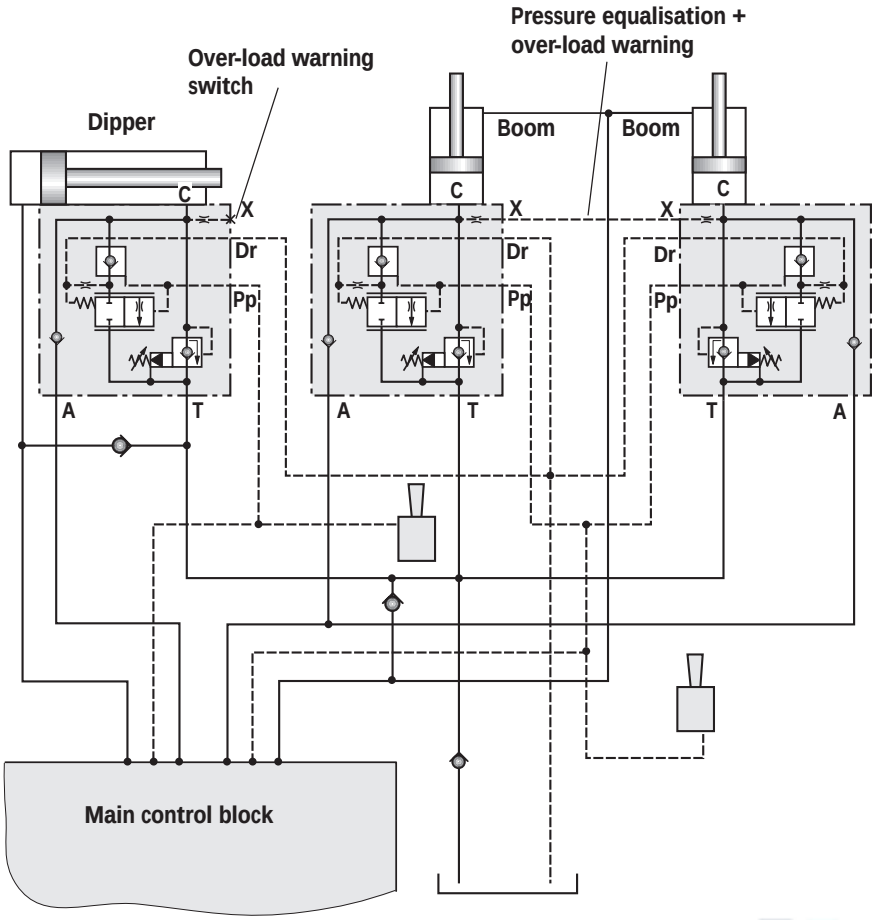

### Control charateristic curve *Pp = f (s)*



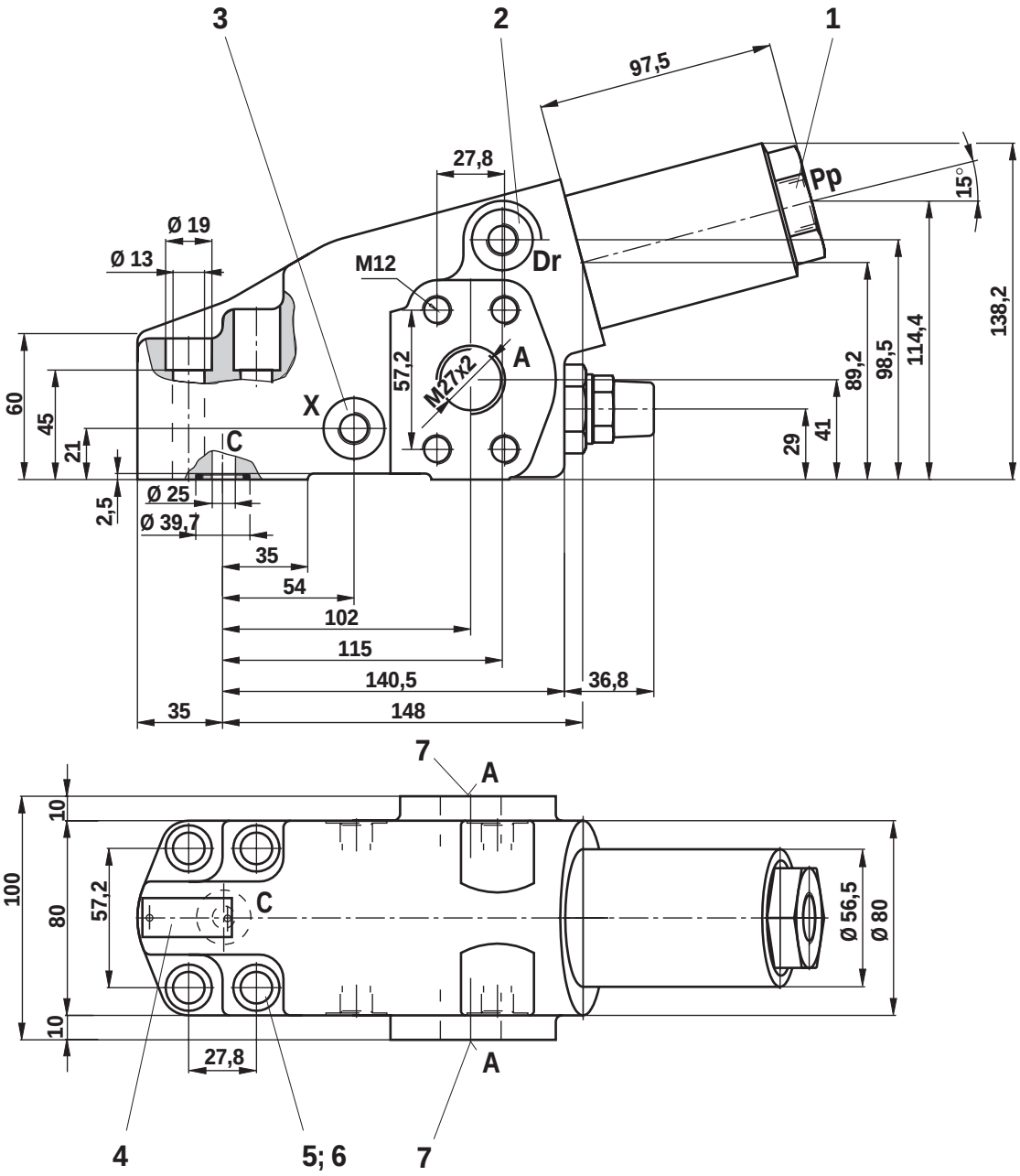
## **Installation example:** type MHRB...**GA**...




## **Installation example:** type MHRB...**GT/GS**...



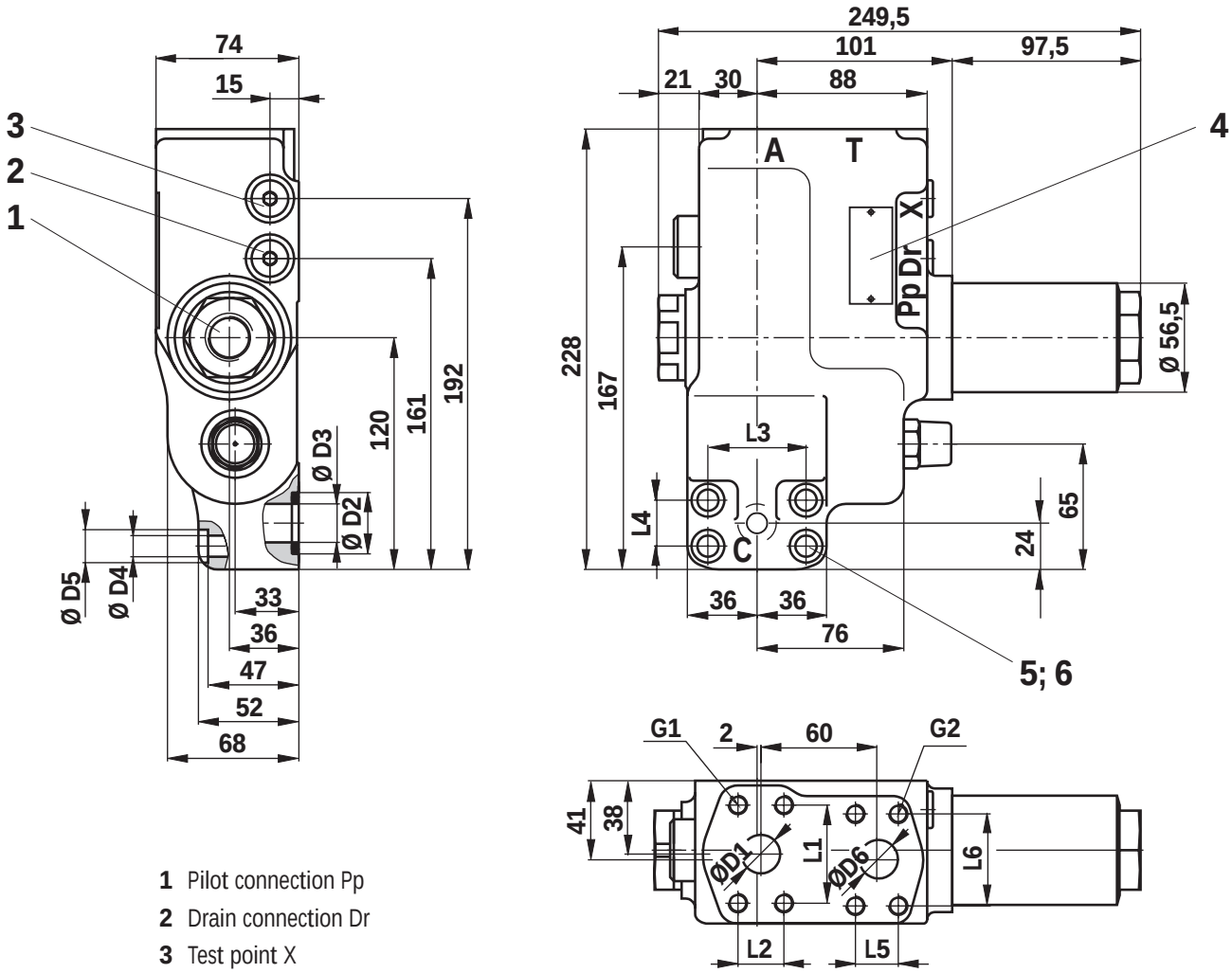
## **Unit dimensions:** type MHRB **22.GA....D** (Dimensions in mm)




| Port | 6000 PSI A, C | Pp | Dr, X |
|---|---|---|---|
| **18** | SAE 1“ | G 1/2 | G 1/4 |

**1** Pilot connection Pp
**2** Drain connection Dr
**3** Test point X
**4** Name plate
**5** Valve fixing screw holes
**6** Valve fixing screws (must be ordered separately)
**7** Port A, optionally pluged plug M27x2 is supplied loose, Tightening torque 90 Nm

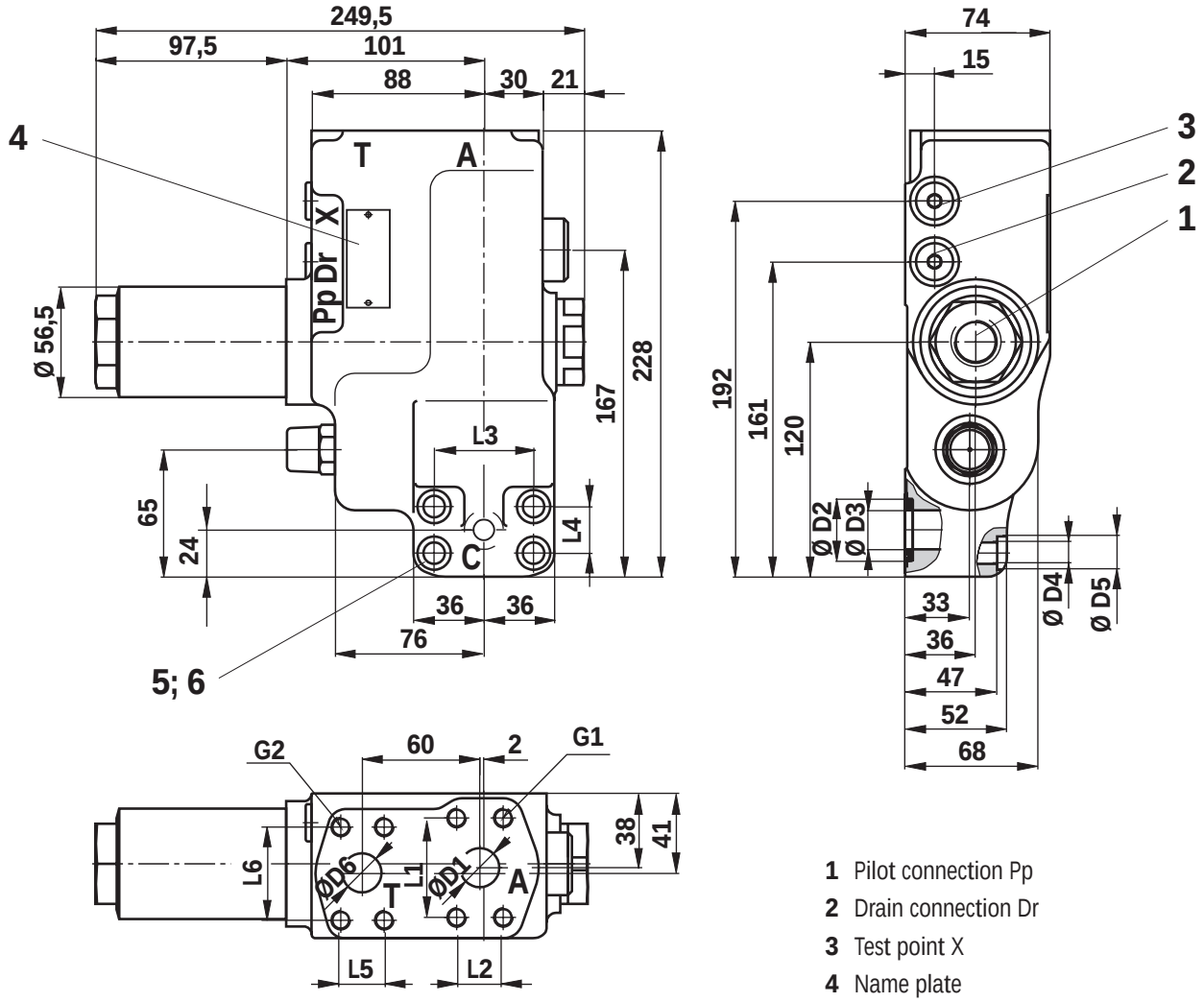
## **Unit dimensions:** type MHRB **16.GT**...**L** (Dimensions in mm)




**1** Pilot connection Pp
**2** Drain connection Dr
**3** Test point X
**4** Name plate
**5** Valve fixing screw holes
**6** Valve fixing screws,
must be ordered separately

| Port | 6000 PSI A, C | 3000 PSI T | Pp | Dr, X | L1 | L2 | L5 | L6 | ØD1 | ØD2 | ØD3 | ØD6 | G1 | G2 | Valve fixing L3 | L4 | ØD4 | ØD5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **53** | SAE 3/4“ | SAE 3/4“ | M22x1,5 | M14x1,5 | 50,8 | 23,8 | 22,2 | 47,6 | 20 | 31,7 | 20 | 20 | M10 | M10 | 50,8 | 23,8 | 11 | 17 |

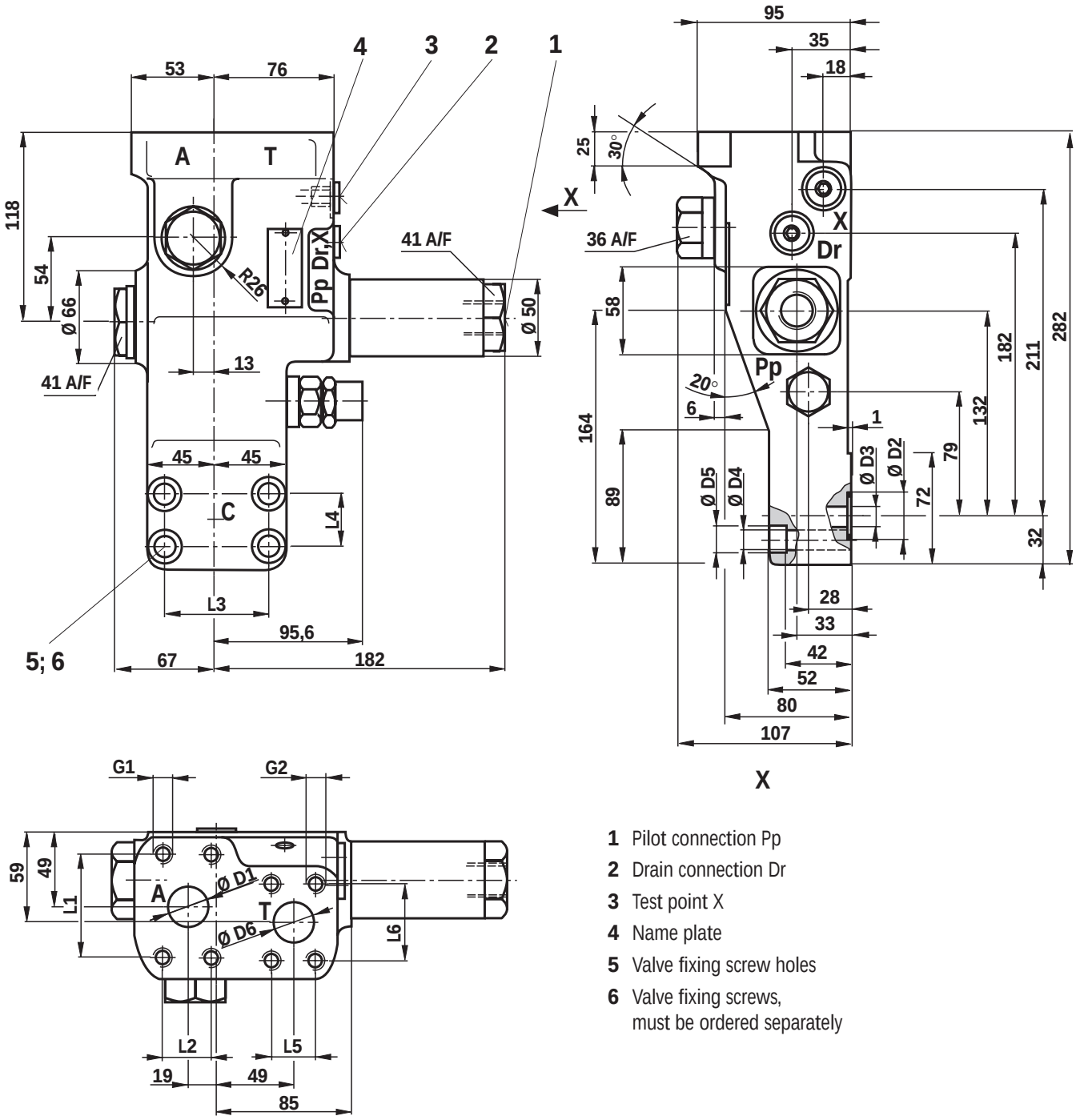
## **Unit dimensions:** type MHRB **16.GT..R** (Dimensions in mm)




**1** Pilot connection Pp
**2** Drain connection Dr
**3** Test point X
**4** Name plate
**5** Valve fixing screw holes
**6** Valve fixing screws, must be ordered separately

| Port | 6000 PSI A, C | 3000 PSI T | Pp | Dr, X | L1 | L2 | L5 | L6 | ØD1 | ØD2 | ØD3 | ØD6 | G1 | G2 | Valve fixing L3 | L4 | ØD4 | ØD5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **53** | SAE 3/4“ | SAE 3/4“ | M22x1,5 | M14x1,5 | 50,8 | 23,8 | 22,2 | 47,6 | 20 | 31,7 | 20 | 20 | M10 | M10 | 50,8 | 23,8 | 11 | 17 |

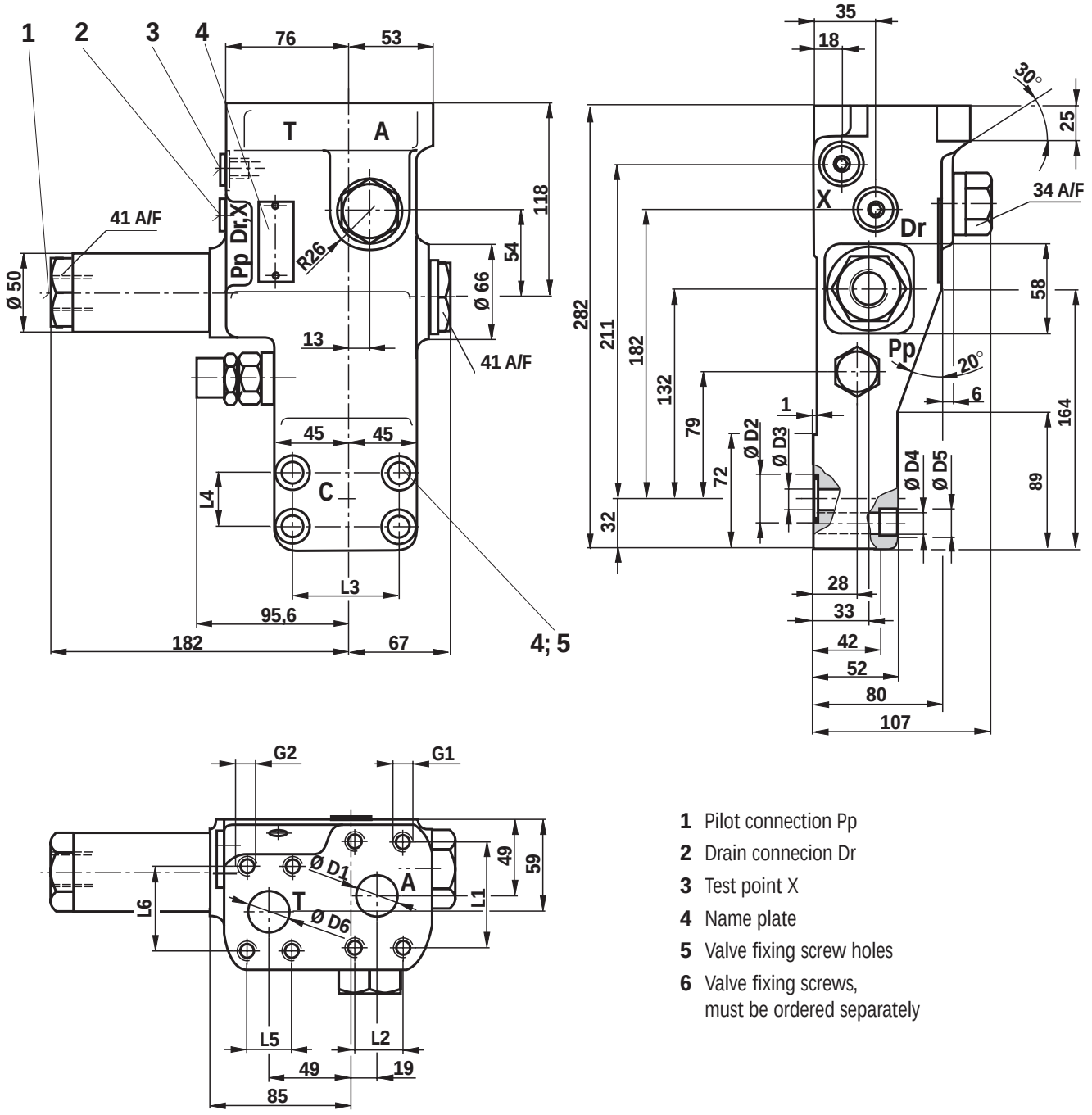
## **Unit dimensions:** type MHRB **22.GT..L** (Dimensions in mm)




**1** Pilot connection Pp
**2** Drain connection Dr
**3** Test point X
**4** Name plate
**5** Valve fixing screw holes
**6** Valve fixing screws,
must be ordered separately

| Port | 6000 PSI A, C | 3000 PSI T | Pp | Dr, X | L1 | L2 | L5 | L6 | ØD1 | ØD2 | ØD3 | ØD6 | G1 | G2 | Valve fixing L3 | L4 | ØD4 | ØD5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **18** | SAE 1“ | SAE 1“ | G 1/2 | G 1/4 | 57,2 | 27,8 | 26,2 | 52,4 | 25 | 39,7 | 25 | 25 | M12 | M10 | 57,2 | 27,8 | 13 | 19 |
| **42K** | SAE 1“ | SAE 3/4“ | 3/4-16 UNF | 9/16-18 UNF | 57,2 | 27,8 | 26,2 | 52,4 | 25 | 39,7 | 25 | 25 | M12 | M10 | 57,2 | 27,8 | 13 | 22 |
| **42** | SAE 1“ | SAE 1“ | | | 57,2 | 27,8 | 26,2 | 52,4 | 25 | 39,7 | 25 | 25 | M12 | M10 | 57,2 | 27,8 | 13 | 22 |
| **49** | SAE 3/4“ | SAE 3/4“ | | | 50,8 | 23,8 | 22,2 | 47,6 | 20 | 31,7 | 20 | 20 | M10 | M10 | 50,8 | 23,8 | 11 | 20 |
| **51** | SAE 11/4“ | SAE 1“ | | | 66,7 | 31,8 | 26,2 | 52,4 | 30 | 44,7 | 30 | 25 | M12 | M10 | 66,7 | 31,8 | 13 | 22 |

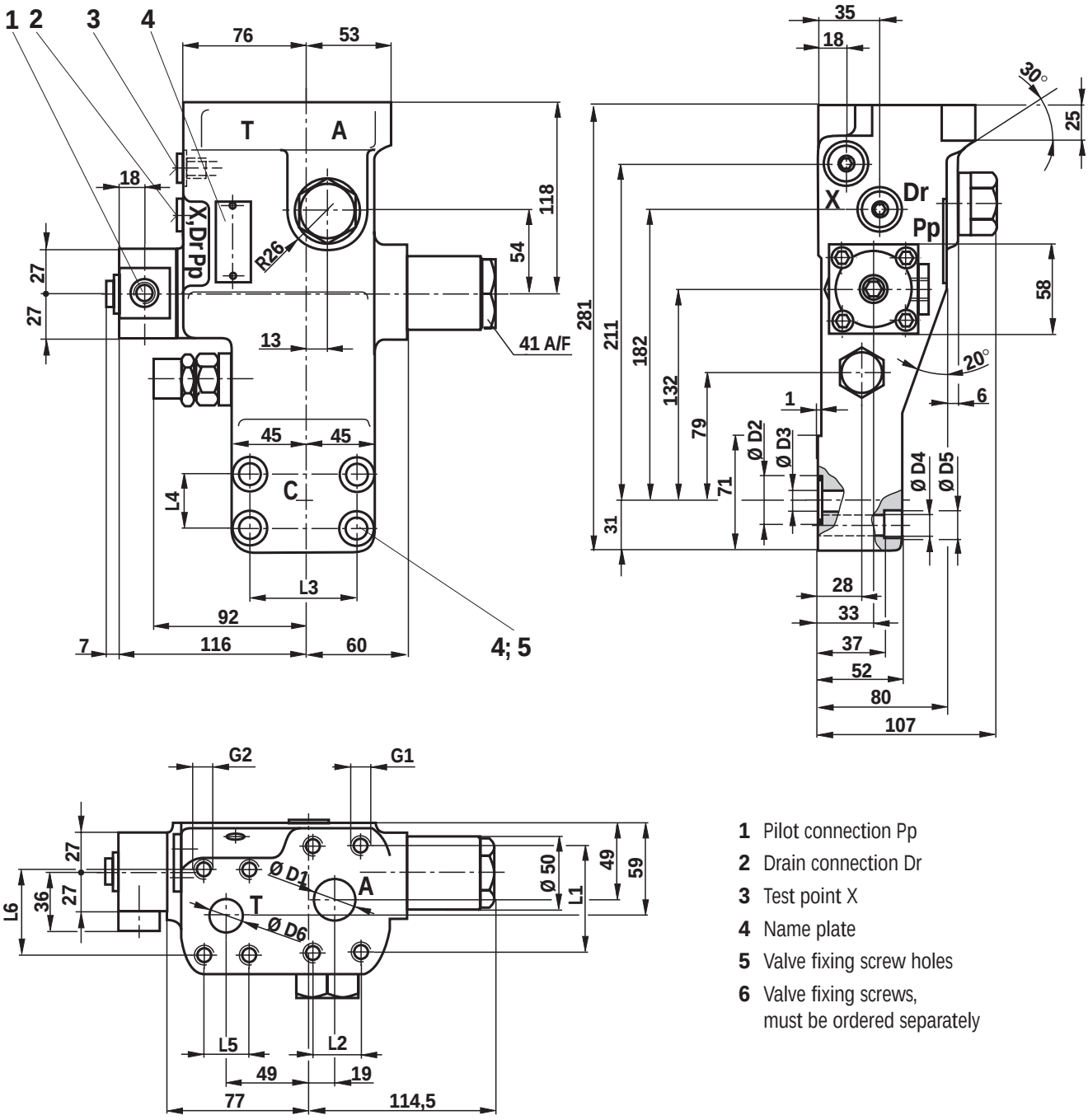
## **Unit dimensions:** type MHRB **22.GT..R** (Dimensions in mm)




**1** Pilot connection Pp
**2** Drain connecion Dr
**3** Test point X
**4** Name plate
**5** Valve fixing screw holes
**6** Valve fixing screws, must be ordered separately

| Port | 6000 PSI A, C | 3000 PSI T | Pp | Dr, X | L1 | L2 | L5 | L6 | ØD1 | ØD2 | ØD3 | ØD6 | G1 | G2 | Valve fixing L3 | L4 | ØD4 | ØD5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **18** | SAE 1“ | SAE 1“ | G 1/2 | G 1/4 | 57,2 | 27,8 | 26,2 | 52,4 | 25 | 39,7 | 25 | 25 | M12 | M10 | 57,2 | 27,8 | 13 | 19 |
| **42K** | SAE 1“ | SAE 3/4“ | 3/4-16 UNF | 9/16-18 UNF | 57,2 | 27,8 | 26,2 | 52,4 | 25 | 39,7 | 25 | 25 | M12 | M10 | 57,2 | 27,8 | 13 | 22 |
| **42** | SAE 1“ | SAE 1“ | | | 57,2 | 27,8 | 26,2 | 52,4 | 25 | 39,7 | 25 | 25 | M12 | M10 | 57,2 | 27,8 | 13 | 22 |
| **49** | SAE 3/4“ | SAE 3/4“ | | | 50,8 | 23,8 | 22,2 | 47,6 | 20 | 31,7 | 20 | 20 | M10 | M10 | 50,8 | 23,8 | 11 | 20 |
| **51** | SAE 11/4“ | SAE 1“ | | | 66,7 | 31,8 | 26,2 | 52,4 | 30 | 44,7 | 30 | 25 | M12 | M10 | 66,7 | 31,8 | 13 | 22 |

## **Unit dimensions:** type MHRB **22.GS..R** (Dimensions in mm)







**1** Pilot connection Pp
**2** Drain connection Dr
**3** Test point X
**4** Name plate
**5** Valve fixing screw holes
**6** Valve fixing screws, must be ordered separately

| Port | 6000 PSI A, C | 3000 PSI T | Pp | Dr, X | L1 | L2 | L5 | L6 | ØD1 | ØD2 | ØD3 | ØD6 | G1 | G2 | Valve fixing L3 | L4 | ØD4 | ØD5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **18** | SAE 1“ | SAE 1“ | G 1/2 | G 1/4 | 57,2 | 27,8 | 26,2 | 52,4 | 25 | 39,7 | 25 | 25 | M12 | M10 | 57,2 | 27,8 | 13 | 19 |
| **42K** | SAE 1“ | SAE 3/4“ | 3/4-16 UNF | 9/16-18 UNF | 57,2 | 27,8 | 26,2 | 52,4 | 25 | 39,7 | 25 | 25 | M12 | M10 | 57,2 | 27,8 | 13 | 22 |
| **42** | SAE 1“ | SAE 1“ | | | 57,2 | 27,8 | 26,2 | 52,4 | 25 | 39,7 | 25 | 25 | M12 | M10 | 57,2 | 27,8 | 13 | 22 |
| **49** | SAE 3/4“ | SAE 3/4“ | | | 50,8 | 23,8 | 22,2 | 47,6 | 20 | 31,7 | 20 | 20 | M10 | M10 | 50,8 | 23,8 | 11 | 20 |
| **51** | SAE 11/4“ | SAE 1“ | | | 66,7 | 31,8 | 26,2 | 52,4 | 30 | 44,7 | 30 | 25 | M12 | M10 | 66,7 | 31,8 | 13 | 22 |

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