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# Overview of the valve testing device
# **VTB1-1X**


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**Always the same problem!!**
A hydraulic drive has a defect and the service personnel received the request to resolve this as soon as possible.
Already after the first assessment it is clear that the problem possibly lies in the hydraulic control circuit of the drive.
But how to limit the defect or even to localize it directly?
Was it caused by the missing setpoint of the external control, does the valve have a sufficiently high power supply, is the control piston in the valve blocked or is there any problem with the system mechanics?
It is frequently the case that several persons on site with different types of know-how are discussing about the technical problem but only presumptions can be made about the cause of the problem. Many questions come to light that can only be answered with difficulty at first instance.


With modern hydraulic valves with integrated electronics (**O**n **B**oard **E**lectronics) the electric signal cable is connected to the valve directly, without further measurement sockets or optical feedback.
Consequently, the electrical engineer has no chance to check the electrical signals directly on the valve.

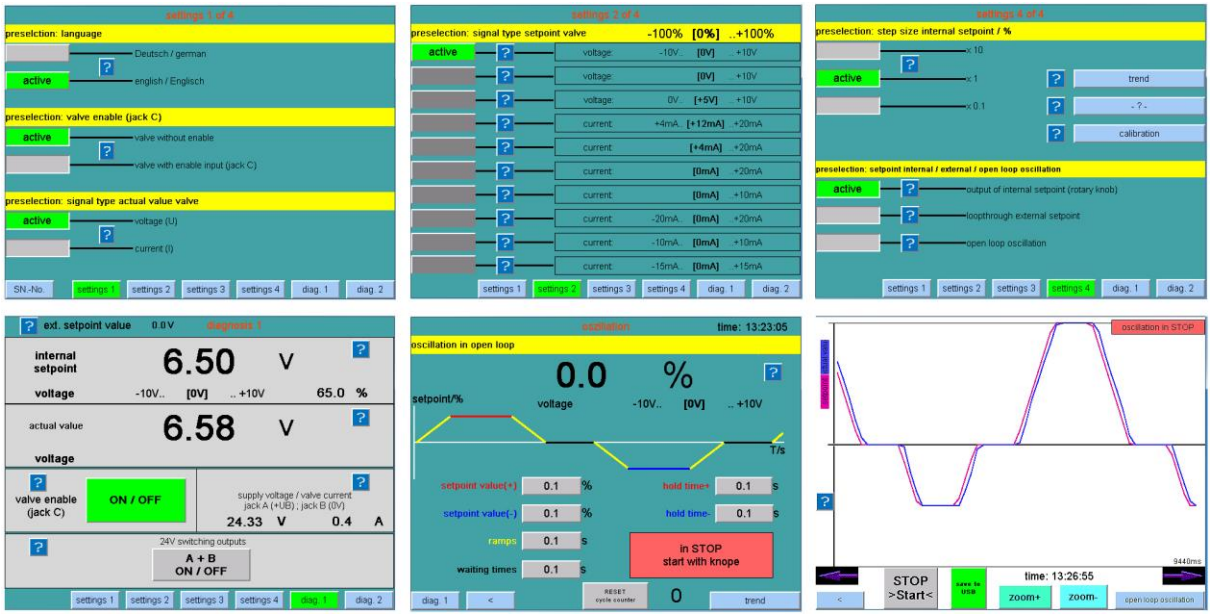
The hydraulic engineer cannot test the function of the valve on site as he cannot manipulate the required setpoint signal of the external control.

The mechanic can also not check system parts since nothing happens without valve function.
All that remains is to exchange suspicious components in the hope that you chose the right component.
Mostly, an exchanged hydraulic valve is not replaced when there is a failure and then it is send to the manufacturer for inspection at high costs.

**That doesn't have to be the case!**

By looping the **valve testing device VTB1-1X** the service personnel has the following options:

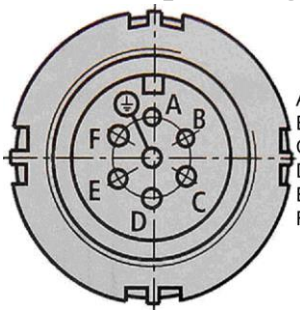
- Test of supply voltage
- Switching of up to two shut-off valves (pressure release)
- Set required valve enable (24V)
- Check external valve setpoints (voltage or current)
- Input of a manually controlled, internal valve setpoint (voltage or current)
- Control of valve actual value (voltage or current)
- Input of a controlled setpoint profile (in %)
- Graphical trend recording of setpoint and actual value with the possibility of data storage to an external USB memory stick



## Overview: Data and technical functions

- Monitored operating voltage: >21V DC .. <28V DC
- Monitored operation current of proportional valve
- Permissible ambient operating temperature: 0°C .. 40°C
- Protection class IP50 (dust-protected, no water protection)
- Weight: 2.35kg
- Resolution of the analog inputs and outputs: 12bit (+-10V; +-20mA)
- No signal delay times with function „loopthrough external setpoint“
- Voltage or current differential input for external valve setpoint.
- Polarity protection of the supply voltage.
- Short-circuit proof switching outputs A & B for 24V solenoid switches.
- Short-circuit proof analog outputs.
- Shock-resistant ABS plastic casing with guard rails.
- Supply voltage via valve supply 24V on the machine or ext. mains adapter.
- Safeguarding of the 24V supply voltage via changeable fuse.
- Standard signal assignment of device input connector and valve cable socket (6+PE).
- All required pre-settings via 7-inch touchscreen configurable.
- Switching function for different national languages.
- Structured, clear menu navigation.
- Selectable help texts for each menu option.
- Functions that cannot be used and which are excluded by menu configurations are hidden graphically and textually.
- Optional drive of a switching shut-off valve or a switching way valve with a 24V solenoid or two 24V solenoids (2A current load per channel).
- Support of 10 possible analog valve setpoint signal types.
- Signal range for valve setpoint and actual value: +-10V ; +-20mA
- Mixed operation is possible (e. g. setpoint: +4..+12..+20mA; actual value-10..0..+10V)
- Additional, standardized valve setpoint display in the unit%.
- Internal valve setpoint set-up via rotary pulse generator with push-button function.
- Parametrizable, open loop oscillation profile for endurance test or bleeding function usable.
- Two-channel, graphical trend display with USB memory function for current valve setpoint and actual value.
- Dependent on the existing machine dynamics, all internal setpoint inputs can be operated via an adjustable ramp time.

## Electrical pin assignment "6+PE" (according to EN 175201-804)




A: +24V DC (Power Supply)
B: 0V Gnd (Power Supply)
C: Actual value- Gnd / 24V enable
D: Setpoint+ (+-10V ; +-20mA)
E: Setpoint- Gnd
F: Actual value+ (+-10V ; +-20mA)

We also supply signal adapters for hydraulic valves with 11-pole device connection.

**Currently, 10 signal types for the valve setpoint configuration are available. The possible signal types consist of three voltage and seven current signal types.**

| | |
|---|---|
| 1. Voltage | -10V .. 0V .. +10V with 0V for the hydraulic zero position |
| 2. Voltage | 0V .. +10V with 0V for the hydraulic zero position |
| 3. Voltage | 0V .. +5V .. +10V with +5V for the hydraulic zero position |
| 4. Current | +4mA .. +12mA ..+20mA with 12mA for the hydraulic zero position |
| 5. Current | +4mA .. +20mA with 4mA for the hydraulic zero position |
| 6. Current | 0mA .. +20mA with 0mA for the hydraulic zero position |
| 7. Current | 0mA .. +10mA with 0mA for the hydraulic zero position |
| 8. Current | -20mA .. 0mA .. +20mA with 0mA for the hydraulic zero position |
| 9. Current | -10mA .. 0mA .. +10mA with 0mA for the hydraulic zero position |
| 10. Current | -15mA .. 0mA .. +15mA with 0mA for the hydraulic zero position |

**The following valve types can be tested with the valve testing device VTB1-1X (For valves with connector plug according to DIN EN 175201-804)**

**Atos (Proportional pressure control valve):**

| | |
|---|---|
| RZMO-A*-010 | RZMO-A*-030 |
| RZMO-TERS(AERS)-010 | HZMO-A*-030 |
| RZGO-A*-010 | RZMO-TERS(AERS)-030 |
| RZGO-TERS(AERS)-010 | RZGO-A*-033 |
| AGMZO-A* | HZGO-031 |
| AGMZO-TERS(AERS) | HZGO-033 |
| AGRCZO-TERS(AERS) | RZGO-TERS(AERS)-033 |

**Atos (Proportional way valve):**

| | | |
|---|---|---|
| DHZE-A | DHZO-T* | DLHZO-T* |
| DKZE-A | DKZOR-T* | DLKZOR-T* |

| | |
|---|---|
| DHZO-A* | DPZO-A* |
| DKZOR-A* | DPZO-T* |
| | DPZO-L* |

**Atos (Proportional integrated valve):**

| | |
|---|---|
| LICZO-A* | LICZO-TERS(AERS) |
| LIMZO-A* | LIMZO-TERS(AERS) |
| LIRZO-A* | LIRZO-TERS(AERS) |

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**Bosch Rexroth (proportional way valve, directly driven)**

| | |
|---|---|
| 4WRAE6… | 4WREEM10… |
| 4WRAE10… | |

| | |
|---|---|
| 4WREE6… | 4WREF6… |
| 4WREE10… | 4WREF10… |

**Bosch Rexroth (proportional way valve, pilot-operated)**

| | | | |
|---|---|---|---|
| 4WRZE10… | 4WRKE10… | 4WRBKE10… | 4WRZEM10… |
| 4WRZE16… | 4WRKE16… | 4WRBKE16… | 4WRZEM16… |
| 4WRZE16… | 4WRKE25… | 4WRBKE27… | 4WRZEM25… |
| 4WRZE32… | 4WRKE27… | 4WRBKE35… | |
| 4WRZE52… | 4WRKE32… | 4WRKE35… | |

**Bosch Rexroth (2-way proportional throttle valve)**
FEE16… (only with suitable adapter)

FESE25… (only with suitable adapter)
FESE32… (only with suitable adapter)
FESE40… (only with suitable adapter)
FESE50… (only with suitable adapter)
FESE63… (only with suitable adapter)

FESXE…

**Bosch Rexroth (proportional current regulation valve)**
3FREEZ6…
3FREEZ10…

**Bosch Rexroth (proportional pressure relief valve, directly driven)**
DBETA… DBETBEX…
DBETE…

**Bosch Rexroth (proportional pressure relief valves, pilot-operated)**
DBEBE6…
DBEBE10…

(Z)DBEE6…

DBEME10…
DBEME20…
DBEME30…

**Bosch Rexroth (proportional pressure relief valves, directly driven)**
3DREPE6…

**Bosch Rexroth (proportional pressure reducing valve, pilot-operated)**
ZDREE6… (only with suitable adapter)
DREE6… (only with suitable adapter)

DREE10… DREBE6X…
DRE(M)E10… DREBE10Z…
DRE(M)E20…
DRE/M)E30)…

**Bosch Rexroth (regulating way valve, directly driven)**

| | | |
|---|---|---|
| 4WRPEH6… | 4WRSE6… | 4WESEH6… |
| 4WRPEH10… | 4WRSE10… | 4WRSEH10… |

**Bosch Rexroth (regulating way valve, pilot-operated)**

| | | |
|---|---|---|
| 4WRLE10… | 4WRTE10… | 4WRDE10… |
| 4WRLE16… | 4WRTE16… | 4WRDE16… |
| 4WRLE25… | 4WRTE25… | 4WRDE25… |
| 4WRLE27… | 4WRTE27… | 4WRDE27… |
| 4WRLE35… | 4WRTE32… | 4WRDE32… |
| | 4WRTE35… | 4WRDE35… |

| | |
|---|---|
| 4WRVE10… | 4WRGE10… |
| 4WRVE16… | 4WRGE16… |
| 4WRVE25… | 4WRGE25… |
| 4WRVE27… | |

**Bosch Rexroth (regulating way valve, pilot-operated)**

2WRCE32… (only with supply voltage UB=24V)
2WRCE40… (only with supply voltage UB=24V)
2WRCE50… (only with supply voltage UB=24V)
2WRCE63… (only with supply voltage UB=24V)
2WRCE80… (only with supply voltage UB=24V)
2WRCE100…(only with supply voltage UB=24V)
2WRCE125…(only with supply voltage UB=24V)
2WRCE160…(only with supply voltage UB=24V)

3WRCE32… (only with supply voltage UB=24V)
3WRCE40… (only with supply voltage UB=24V)
3WRCE50… (only with supply voltage UB=24V)
3WRCE63… (only with supply voltage UB=24V)
3WRCE80… (only with supply voltage UB=24V)
3WRCE100…(only with supply voltage UB=24V)
3WRCE125…(only with supply voltage UB=24V)
3WRCE160…(only with supply voltage UB=24V)

3WRCBEE25…
3WRCBEE32…
3WRCBEE50…

**Bosch Rexroth (servo way valve)**
4WSE3E16… (only with supply voltage UB=24V)
4WSE3E25… (only with supply voltage UB=24V)
4WSE3E32… (only with supply voltage UB=24V)

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**Duplomatic (proportional pressure valve):**
PRE*G…
PRE*J…
PRED3G…
PRED3J…

**Duplomatic (proportional way valve):**
DSE3G…
DSE5G…
DSPE*G…

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**EMG:**
Servo valve SV1-06

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**EATON Servo-Performance proportional directional valve:**
**AxisPro**
KBS*-3-… (only Local mode « Level 1 », analog interface)
KBS*-5-… (only Local mode « Level 1 », analog interface)

**EATON Vickers (pressure relief valve):**
KBCG-3
KBCG-6
KBCG-8
KBX( C ) G-6
KBX( C ) G-8

**EATON Vickers (poportional way valve):**

| | | | |
|---|---|---|---|
| KBFDG5V-5 | KBD/T-3 | KBFD/TG4V-3 | KBHDG5V-7 |
| KBFDG5V-7 | KBDG5V5 | KBSDG4V-3 | KBHDG5V-8 |
| KBFDG5V-8 | KBDG5V7 | KBFD/TG4V-5 | KBHDG5V-10 |
| KBFDG5V-10 | KBDG5V8 | KBSDG4V-5 | |
| | KBDG5V10 | KBHDG5V-5 | |

**Grieger (proportional pressure valve) :**
DBV OBE NG06
DBV OBE NG10

**Grieger (poportional way valve) :**
OBE NG06
OBE NG10
OBE NG16
**HYDAC (poportional way valve):**
P4WEE10…

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**Moog (directly-driven servo valve):**
D633…
D634…

**Moog (directly-driven servo valve with optional field bus interface):**
D636…
D637…

**Moog (pilot-operated proportional valve):**
D661…
D662…
D663…
D664…
D665…

**Moog (pilot-operated servo valve with optional field bus interface):**
D671…
D672…
D673…
D674…
D675…

**Moog (pilot-operated proportional valve):**
D681…
D682…
D683…
D684…
D685…

**Parker Hannifin: (proportional way valve):**

| **“standard”** | **“high precision”** | **“for controlled applications”** |
|---|---|---|
| D1FB… | D31FH… | D1FP... |
| D3FB… | D41FH… | D3FP… |
| D31FB… | D81FH… | D30FP… |
| D41FB… | D91FH… | D31FP… |
| D91FB… | D111FH… | D41FP… |
| D111FB… | D31FE… | D91FP… |
| D1FV*3… | D41FE… | D111FP… |
| | D81FE… | |
| | D91FE… | |
| | D111FE… | |

**Parker Hannifin (proportional pressure relief valves):**
RE06M*T…

R4V…
R6V…
RE*E*T…

**Parker Hannifin (proportional throttle valve):**
TDP…
TEP…
TPQ…

**Tiefenbach:**
Directly driven 2/2-way seat valve NG (NW)10

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**EMG Automation:**
Servo valve NG6 SV1-06...E

**Schneider Kreuznach:**

HVM 025
HVM 061 (NG6)
HVM 062 (NG6)
HVM 063 (NG6)
HVM 064 (NG6)

HVM 057 (NG10)
HVM 067 (NG10)
HVM 090 (NG10)
HVM 188 (NG25)
HVM 250 (NG25)

| | |
|---|---|
| With special hole pattern | HVM 106 |
| | HVM 107 |

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**Yuken (proportional way valve):**
ELDFG-01EH
ELDFG-03EH

**Yuken (servo valve):**
LSVHG-03EH
LSVHG-04EH
LSVHG-06EH