VT-HDT Box
Test device for proportional valves with integrated electronics (OBE)

Type VT-HDT-1-2X

Operating Manual

The test device is suitable for the controlling and functional testing of proportional valves with integrated electronics (OBE) with an operating voltage of +24V.

Test device VT-HDT-1-2X

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Features

- The test device simplify the commissioning and troubleshooting of hydraulic systems with proportional valves with integrated electronics
- Simple and intuitive operation via touchscreen
- Screens for digital or analog display
- Automatic valve detection
- Setpoint generator with interval function
- Ramp function
- Potentiometer operation
- Dead man´s handle
- 2 outputs for switching valves
- Sockets for external measurements
- Service case with test device, 24 V power supply, OBE connection cable and 2 cables for switching valves (see ordering information)

Service case VT-HDTSY-1-2X

Notice:

The test device might only be used by persons who are familiar with the device, the valve, and the hydraulic system. With the corresponding setting, the control signals coming from the system are going to be ignored. If control-side safety regulations are provided, they are thereby rendered inoperable.
The use of the device on running systems is always at your own risk!
No liability will be accepted for damage caused by incorrect operation!

Content

Read this documentation completely, and in particular the safety and warning instructions, before you work with the product.

Ordering code:

Pos.	Designation	Type	Part No.
1	Test device VT-HDT Box	VT-HDT-1-2X	R996037000
2	OBE-Connection cable 6-pol. 3m	VT-HDTK-1-2X	R996037001
3	Power supply unit 120W, 90-264VAC/+24VDC/5A	VT-HDTNT-5-2X	R996025391
4	Switching valve cable 3m	VT-HDTSK-1-2X	R996037002
5	Service case (consisting of: Pos.1, 2, 3)	VT-HDTSY-1-2X/1-1-0-1-0	R996036999
6	Service case compl. incl. 2 switching valve cables	VT-HDTSY-1-2X/1-1-2-1-0	**R996043985**

Warning

Usage is only granted to qualified personnel!
Only for the intended use!
The correct connection and the correct settings on the device must be ensured!

In particular, the use of the device on running machines poses risks for material and human, which only the operator has to estimate!

The device must be handled with care, especially soiling, moisture, condensation and mechanical loads should be avoided!
Use in potentially explosive environments is prohibited!

Test device type VT-HDT-1-2X

Approbiate use:

The test device is intended for checking the function of proportional valves with OnBoardElectronic (OBE) with an operating voltage of +24V
These can be directional valves, throttles, pressure limiting, proportional valves, etc.

The power supply is done either by power supply unit +24V (VT-HDTNT) or valve cable on site.

The operating mode "Simulator mode" may only be used, when the valve , which is going to get tested, is removed (from the machine separated) or appropriate security measures have been implemented.

Type VT-HDT-1-2X

Touchscreen:

The brightly lit TFT touchscreen is easy to read and intuitive to use.

The resistive touchscreen is resistant to dirt.

General conditions:

The valve supply (24V) is applied to terminals A (+) and B (-).
The setpoint is applied to terminals D (+) and E (-).
The actual value is applied to the terminals F (+) and C (-).

Exception: Setting in the screen RANGE: 24V-> C, F: B (E)

With this setting, 24V are switched to terminal C (for example: Enable).
The actual value is measured in this case at the terminals F (+) and B (-).

For valves, which provide the actual value at the terminals F (+) and E (-), please contact the manufacturer.

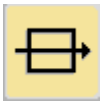
⚠ Warning

The range setting '24V-> C, F: B (E)' causes 24V to reach terminal C.
This can lead to defects at unsuitable valves or cause machinery movement.
The user will be informed by an additional security prompt.

Operating modes and functions:

External mode:

The signals from the valve input connector are looped through to the valve output connector. The signals are measured internally and displayed. A setpoint specification is not possible.

External mode is active 

Simulator mode:

The setpoint is generated internally and output to the valve output connector.
Depending on the preselection, setpoint can be set via potentiometer or touch screen.
The output setpoint and the actual value from the valve are measured and displayed.

Simulator mode active 

Burden resistance at mA ranges:

In external mode, the current for actual value flows over the burden resistance of the ext. control.
In simulator mode over the internal burden resistance of the test device.

Warning

Only use the operating mode "simulator mode" if the valve, which is going to get tested, has been removed (disconnected from the machine) or if appropriate safety measures have been implemented by the operator!

Dead man´s handle:

Deadman active 

When working on systems, this operating mode is required.
A setpoint specification is only possible, when the button is pressed.
If the button released, the setpoint goes to 0%; The switching valves are not switched off, when the button is released.
When the button is pressed again, the setpoint remains at 0%; A setpoint must be specified again.
The status of the dead man´s handle is displayed at the 'Range bar' (red / green)

Warning

The dead man´s handle is not a safety device in sense of machine safety rules!

Operation with potentiometer:

Potentiometer active 

The valve setpoint is changeable with a potentiometer. The touch functions are not active.
The center position of the potentiometer always equals 0% (no movement)

i.e.: Middle position corresponds to 12mA at range 4 .. (12) .. 20mA
Center position corresponds to 0V at range (0) .. +10V (left side of adjustmant range not active)

When potentiometer operation is activated, the output setpoint is 0%, independent of the current position.
Only after the potentiometer has been turned to 'zero position' once, the potentiometer is active.
('Range bar' changes from 'Orange' to 'Green')

This applies:
- when power up the test device
- when selecting the operation with potentiometer
- when working with dead man´s handle

Sockets for external measurements:

Measuring sockets active 

The setpoint and the actual value of the valve can be recorded (external measuring devices, data loggers).
The measured values are only available at the sockets if this setting is activated.
The sockets are wired internally, according to the range selected (V or mA - no jumper is needed at the measuring sockets).

The measuring sockets can also be used:
- for device calibration
- for controlling a frequency converter or other devices (in the V range without special adapter cable)

⚠ Attention

Only devices with potential-free measuring inputs may be connected!

Analog curves:

4 curves active 

It can be selected whether only the setpoint and the actual value are shown in screen 'ANALOG' or additionally 'Uv' and 'Iv'.

Automatic valve detection:

Valve detection active 

The plugging and unplugging of a valve is detected and in these cases the screen 'Range' is displayed. When a valve is plugged in, it is further detected whether it is a valve with V- or mA range and only the corresponding ranges are displayed for selection.

Warning

If this setting is activated, a setpoint of 900 mV is output for 25 ms (when a valve is connected).
This must be taken into account during operation with systems!
The valve detection only works with a valve current consumption > 30 mA!

Ramp function:

Ramp active 20 

If this setting is activated, the setpoint is not output directly, but by a ramp function.

Value input via selection and '+/-' keys:
Volt - range: ramp value 20 -> 10V/s, ramp value 40 -> 20V/s
mA - range: Ramp value 35 -> 20mA/s, ramp value 70 -> 40mA/s
High value -> steep ramp, low value -> flat ramp.

Warning

ATTENTION: Ramp remains active, even when operated with dead man´s handle!

Function interval:

Interval active 15 

This enables automatic setpoint output with adjustable profile.
Setting value in 1/10 s; Value input via selection and '+/-' keys.

e.g. Ramp 20, interval 15, 'MI' + 5V, 'MII' -1V:
- Setpoint moves to 'MI' value for 1.5 sec. with selected ramp.
- Following moves to 'MII' value for 1.5 sec. with selected ramp, and so on

The function is deactivated by unselection or when a setpoint entry is done via the touchscreen.

Internal mA Resistance:

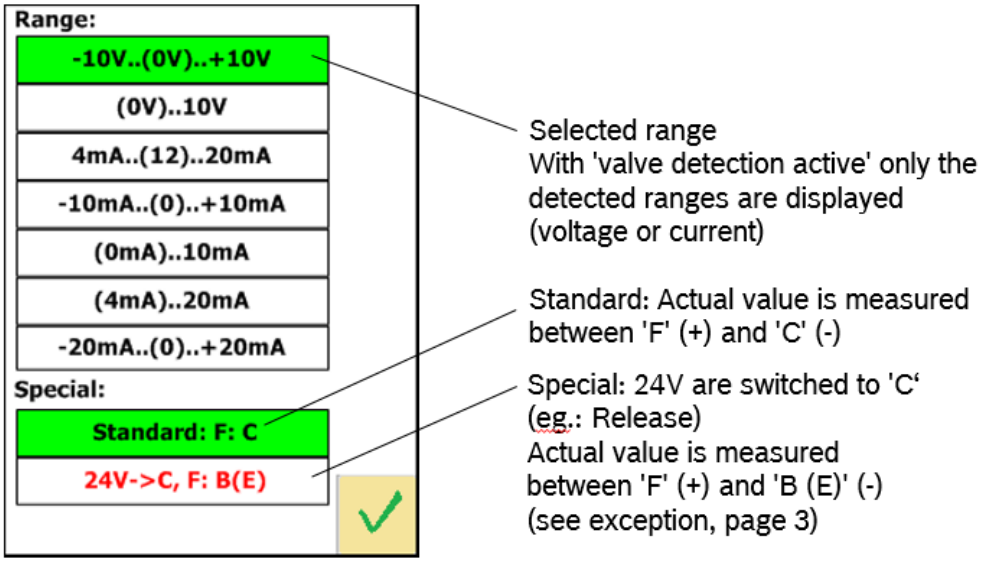
Resistance on 

When in 'External mode' (and mA Range) the loop current for 'Actual value' usually flows through the burden resistance of the external control (PLC).
If this burden does not exist, a resistance in the test device can be switched on, to enable readout of 'Actual value'.

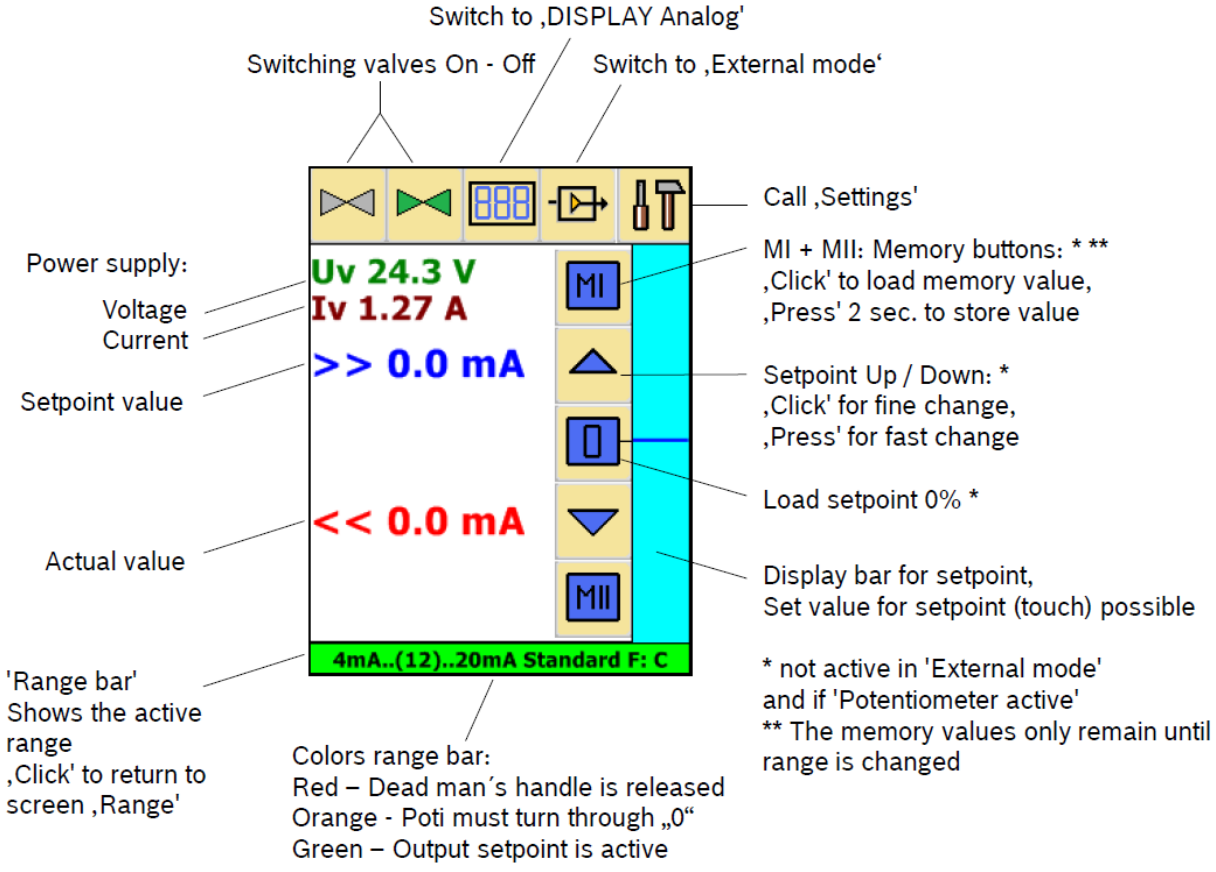
Screens:

Screen 'Range':

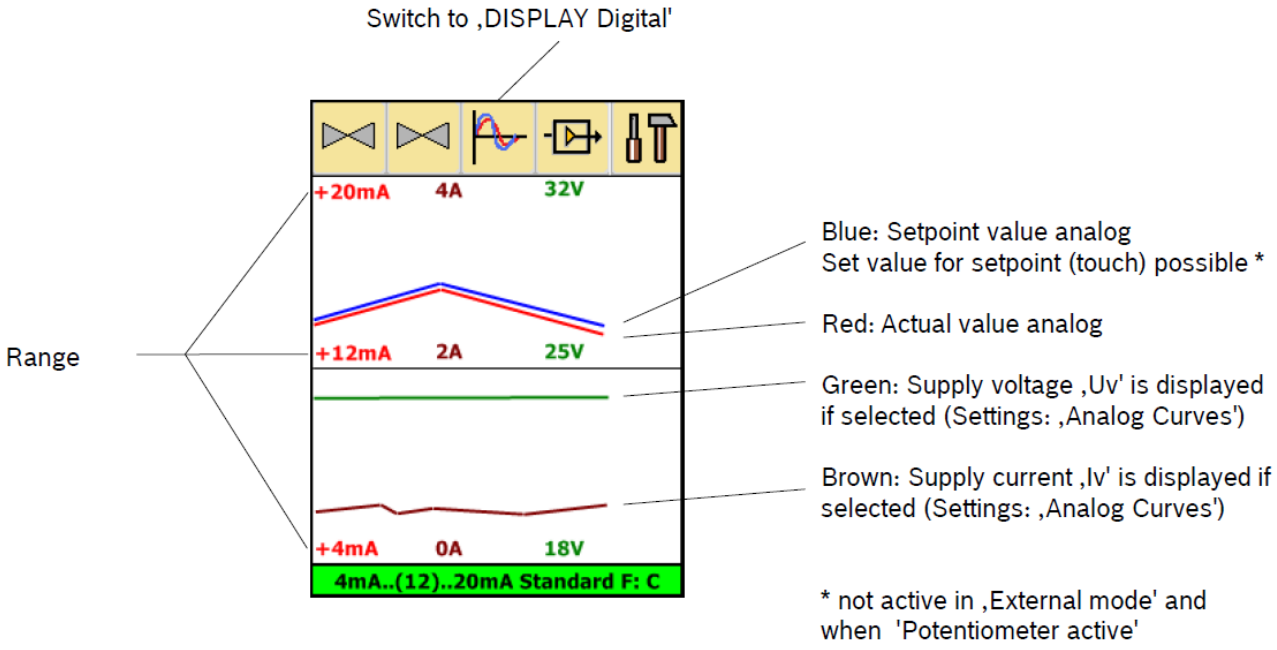
Is displayed: -at power up
-after connecting or disconnecting a valve, if 'valve detection active' is enabled
-by 'Click' on 'Range bar' in screen 'DISPLAY VALUES'



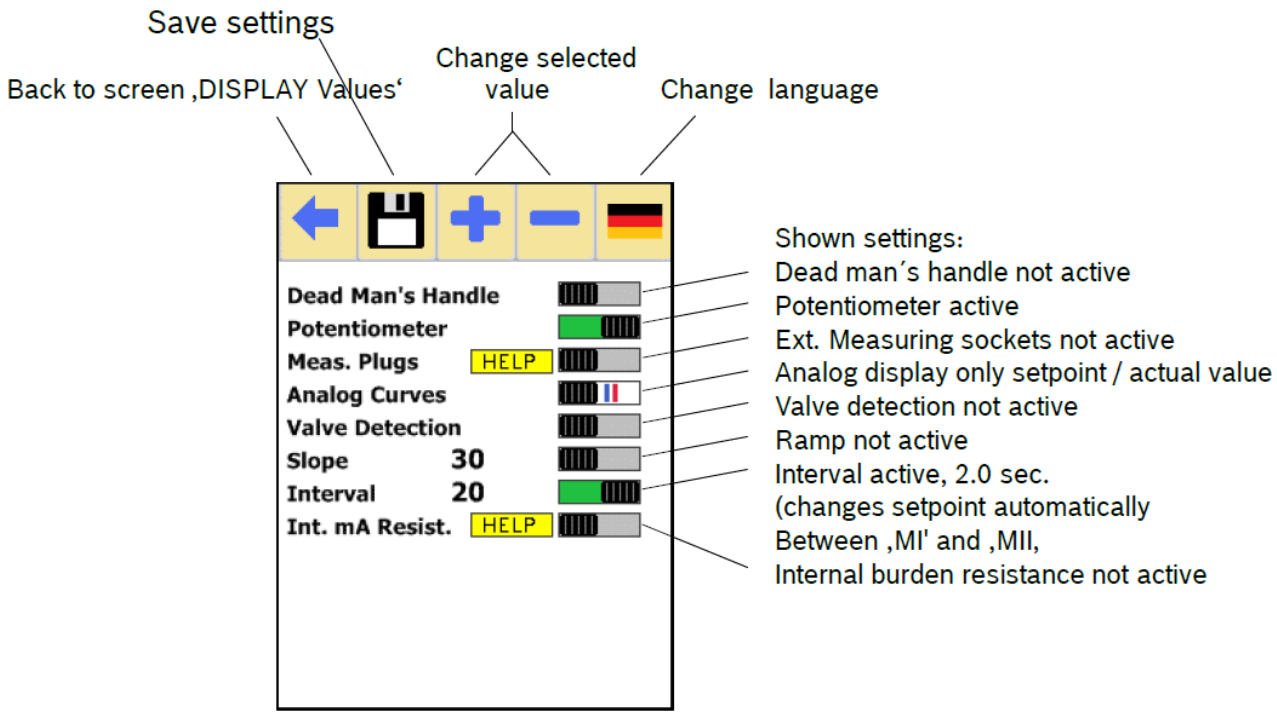
Screen 'Display Values (Digital)':



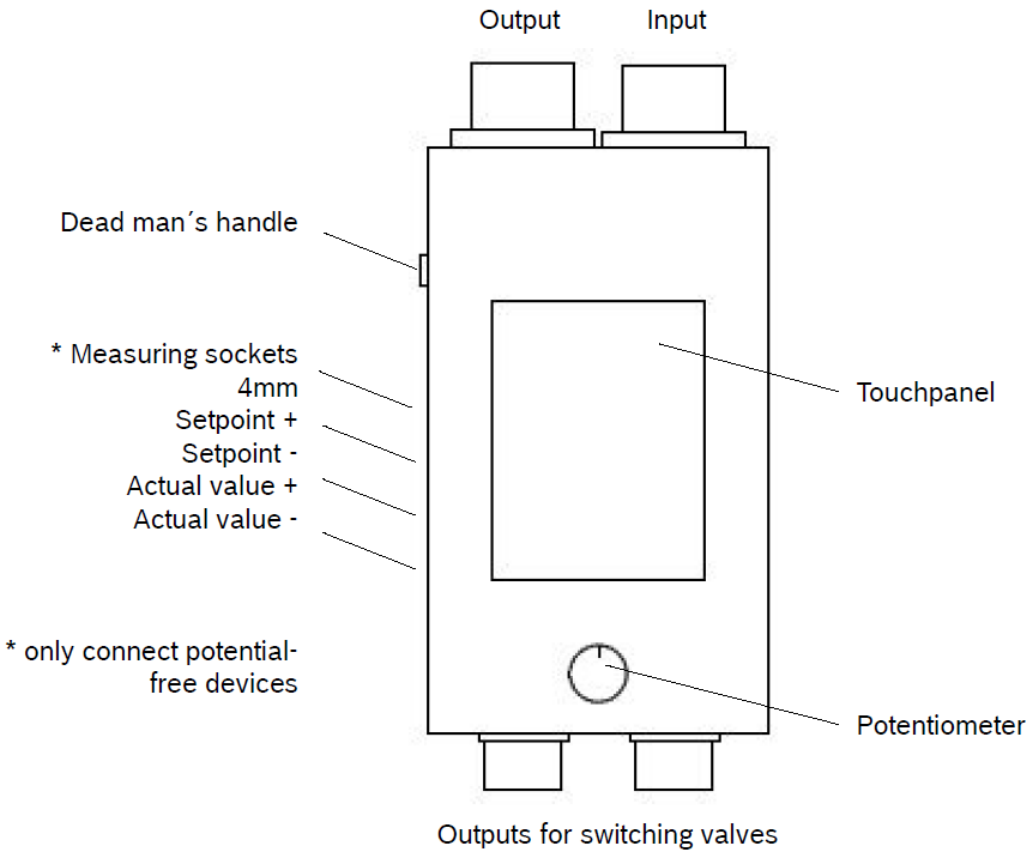
Screen 'Display Values (Analog)':



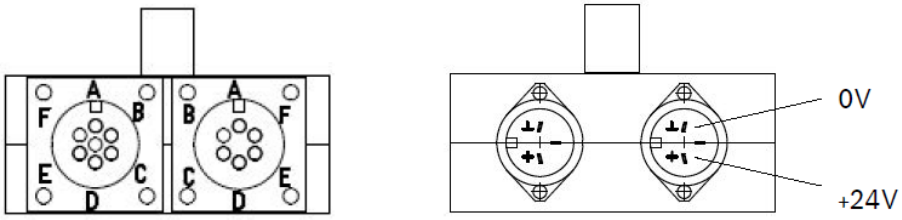
Screen 'Settings':



Device view:



Connections:



Input Output

Outputs for switching valves

A Supply voltage +24V
B Supply voltage 0V
C Actual value –
D Setpoint +
E Setpoint –
F Actual value +

Connection material	Manuf. number	Manufacturer
Cable socket input	CM06EA14S-61S	Hirschmann
Cable plug output	MS3106A-14S-6P	Amphenol
Cable plug sw. Valves	0202001	BKL

Technical data:

Mechanically:			
Dimensions	with plugs and potentiometer knob	155 x 73 x 47	mm
Weight		250	g
Protection		IP40	
Temperature range		0...+40	°C
Humidity		no condensation	
Electrical:			
Supply voltage		24 (20...30)	V DC
Current consumption	for test device 24V	ca. 50	mA
	for OBE-valve + 2 switching valves	max. 5	A
Reverse polarity protection	for test device	YES	
Overvoltage protection	suppresor diode 30V	YES	
Device fuse	OBE-valve, PTC self-resetting	3	A
	switching valves, PTC self-resetting	1,8	A
Max. output voltage	setpoint out	±15	V
	short circuit protected	YES	
Burden resistance	internal current measurements	56	Ω
	internal burden resistance (mA ranges)	100	Ω
	external max.	500	Ω
Accuracy		±2	%
CE-conformity	Low Voltage Directive LVD 2014/35/EU	YES	
	EMC-Directive 2014/30/EU	YES	
	RoHS-Directive 2011/65/EU	YES	
Connections:			
Valve input	connector plug flange	CM02E14S-61P	
	matching cable socket	CM06EA14S-61S	
Valve output	connector socket flange	MS3102A-14S-6S	
	matching cable plug	MS3106A-14S-6P	
Switching valve	connector socket flange	0202015	
	matching cable socket	0202001	
Measuring sockets	standard	4	mm

Service case VT-HDTSY-1-2X

The service case contains the test device VT-HDT-1-2X, the 24 V power supply unit and the OBE-connection cable.

Depending on the order variant (see ordering code, page 2), 2 pieces of switching valve cables are included in the case.

Typ VT-HDTSY-1-2X

Technical data:		
Design		Aluminum frame case with 2 locks, 3 hinges
Dimensions (B x H x D)	mm	450 x 100 x 350
Weight	kg	4,5

Power supply unit VT-HDTNT-5-2X

Table power supply unit 90-264 VAC →24 VDC; 5 A
The power connector of the power supply unit fits sockets in Germany and many other European countries.
In some countries, a country-specific adapter needs to be used. This is not included in the scope of delivery.

Type VT-HDTNT-5-2X (actual product may differ)

Technical data:			
Operating voltage	U	VAC	90…264; 47…63 Hz
Current consumption	I_{max}	A	1,2
Fuse			electronic overload protection
Output voltage	U	VDC	24 ± 1 V; 5 A
Length of the power cable	l	m	approx. 1,5
Length of the cable to the test device	l	m	approx 1,5
Dimensions (B x H x D)		mm	139 x 61 x 36
Weight	m	kg	0,46

OBE-Connection cable VT-HDTK-1-2X

Connection cable between test device VT-HDT-1-2X and proportional valves with integrated electronics (valves with ordering code **K9** and **K31** for the electrical connection)

Type VT-HDTK-1-2X (actual product may differ)

Technical data:			
Connection for valve			Mating connector according to DIN EN 175201-804
Connection for test device			Connector Amphenol MS3106A 14S 6P
Length of connection cable	l	m	3
Weight	m	kg	0,3

Notices:
When operating valves with electrical connection K31, the ground conductor is interrupted.

Cable for switching valve VT-HDTSK-1-2X

Connection cable between test device VT-HDT-1-2X and switching valves with electrical connection K4.

Type VT-HDTSK-1-2X (actual product may differ)

Technical data:			
Connection for valve			Connector acc. DIN EN 175301-803, 2-po. + PE
Connection for test device			Connector BKL 0202001
Length of connection cable	l	m	3
Weight	m	kg	0,2

Environmental protection and disposal:

Environmental protection:

Our products don´t contain no hazardous substances that they can release under normal conditions of use. Normally, therefore, no negative effects on the environment are to be feared.

Disposal:

The products manufactured by us can be returned to us for disposal free of charge.
The prerequisite is, however, that no disturbing attachments such as oils, fats or other impurities are included.

Furthermore, inappropriate foreign substances or components must not be included in the return.

The products are free to deliver to the address indicated on the back.

The packaging materials are made of cardboard, wood and polystyrene. They can be used easily everywhere.

For ecological reasons, the return transport should be avoided.

Notes:

Notes:

Notes:

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