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rexroth
A Bosch Company

Service case with test device for proportional servo valves with integrated electronics (OBE)

Type VT-VETSY-1


H5967

- Component series 1X

Features

- Service case
  - Test device, 24V power supply unit, connection cable and adapter (see ordering code)
- Test device
  - suitable for the control and functional testing of proportional servo valves with integrated electronics and an operating voltage of ±15V or +24V
  - Simplifies commissioning and troubleshooting in hydraulic systems with proportional servo valves

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Ordering code

01	02	03	04	05	06	07	08
VT-VETSY-1	**–**	**1X**	**/**	**1**	**–**	**2**	**–**	**1**	**–**	**1**	**–**	**0**	**/**	*****

01	Service case with test device for proportional servo valves with integrated electronics (OBE)	**VT-VETSY-1**
02	Component series 10 ... 19 (10 to 19: unchanged technical data and pin assignment)	**1X**
03	Test device type VT-VET-1-1X	**1**
Connection cable to the valve		
04	2 units, 6-pole, type VT-VETK-1-1X	**2**
Adapter cable for valve type 4WSE2EM 6 -1X		
05	Type VT-VETAK-1-1X	**1**
Power supply unit		
06	90 ... 264 VAC; +24 VDC, 3.75 A; type VT-VETNT-3-1X/G24	**1**
07	**Without** power supply unit	**0**
08	Further details in the plain text	*****

Test device type VT-VET-1-1X

The test device is suitable for the control and functional testing of proportional servo valves with integrated electronics and an operating voltage of ±15V or +24V.

Operating modes

- External operation → Looping in of the operating voltage and the command values from the control cabinet to the valve
- Internal / external operation → Command value presetting via the test device; operating voltage from the control cabinet
- Internal operation → Operating voltage via a separate power supply unit; command value presetting via the test device
- Command value presetting via BNC socket → Operating voltage optional

☞ **Notice:**
The test device may only be used by persons who are familiar with the device, the valve and the hydraulic system. With corresponding setting, it will ignore the control signals coming from the system. If safety precautions have been taken on the control side, they are invalidated.
For damage caused by the incorrect operation, no liability is accepted.

Function, operating instructions

Voltage supply

The test device can be supplied with +24 V or ±15 V, depending on the operating voltage required by the valve. To this end, the "power selector" change-over switch must be set accordingly before the commissioning.

An internal DC/DC converter creates the required auxiliary voltages ±15 V for the internal command value presetting.

The "power selector" selector switch amongst others switches the internal **reference potential L0** to the relevant, externally applied ground.

Spool position "+24 V" → input pin B = reference potential

Spool position "±15 V" → input pin C = reference potential

Connections

- **Input connector ES (1) and 4 mm input sockets**
  The input connector ES (1) on the left side serves the connection of the connection cable coming from the control or from the control cabinet. Depending on the setting of the operating elements (see operating and display elements), the 4 mm sockets on the left side are directly connected to the pins of the input connector ES (1).
  So all signals coming from the control can be measured at the sockets.
  For operation of the test device and the valve, the necessary operating voltages +24 V or ±15 V (depending on the valve type) must be available.
  If no operating voltage is available yet on the control cabinet side, a corresponding power supply unit can be connected at the input connector ES.

- **Output socket AB (16) and 4 mm output sockets**
  The output socket AB (16) on the right side serves the connection of the valve. The 4 mm sockets on the right side are directly connected with the pins of output socket AB (16).
  So all signals to or from the valve can be measured at the 4 mm sockets.
  By means of the short-circuit connectors, every single wire of the connection cable can be separated, e.g. for allowing for current measurement.

- **BNC socket**
  At the BNC socket, an externally generated command value signal can be fed in via a standardized 50 Ω cable. In this connection, the "setpoint selector" command value switch is to be switched to "BNC" position.

- **PE socket**
  The PE socket is directly connected to the PE connection of the input connector ES (1). The output socket AB (16) does not have a PE connection.

Item explanations can be found on page 5.

Potentiometer / trimmer

Designation	Function	Prerequisites
Setpoint internal	Command value presetting to the valve (AB - pin D) The output switches automatically between $U_{Command}$ = ±10 V or $I_{Command}$ = ±20 mA, depending on the load resistance of the valve command value input.	Operating voltage at the input connector ES Position of the "power selector" switch according to the operating voltage type "Setpoint selector" switch to "internal" position "Stepfunction key" push-button not pressed
Stepfunction level	Setting the step amplitude The step function is activated by means of the "stepfunction key" push-button.	Operating voltage at the input connector ES Position of the "power selector" switch according to the operating voltage type "Setpoint selector" switch to "internal" position Operation of the "stepfunction key" push-button triggers the step function.

Function, operating instructions

LED displays

Designation	Function	Prerequisites
power	Display of the internal voltage supply	Operating voltage at the input connector ES
enable indication control	Indication of the enable signal coming from the control / the control cabinet (input socket ES - pin C)	Operating voltage amounts to +24 V "power selector" switch to "24 V" position "power" LED is illuminated
enable indication valve	Indication of the enable signal going to the valve (output socket AB - pin C and measuring socket C). The LED is also illuminated if an enable signal is only available at the left 4 mm measuring socket. Without short-circuit connector, this signal is not available at the output socket AB and thus at the valve.	Operating voltage amounts to +24 V "power selector" switch to "24 V" position "power" LED is illuminated Enable signal is activated

Switch

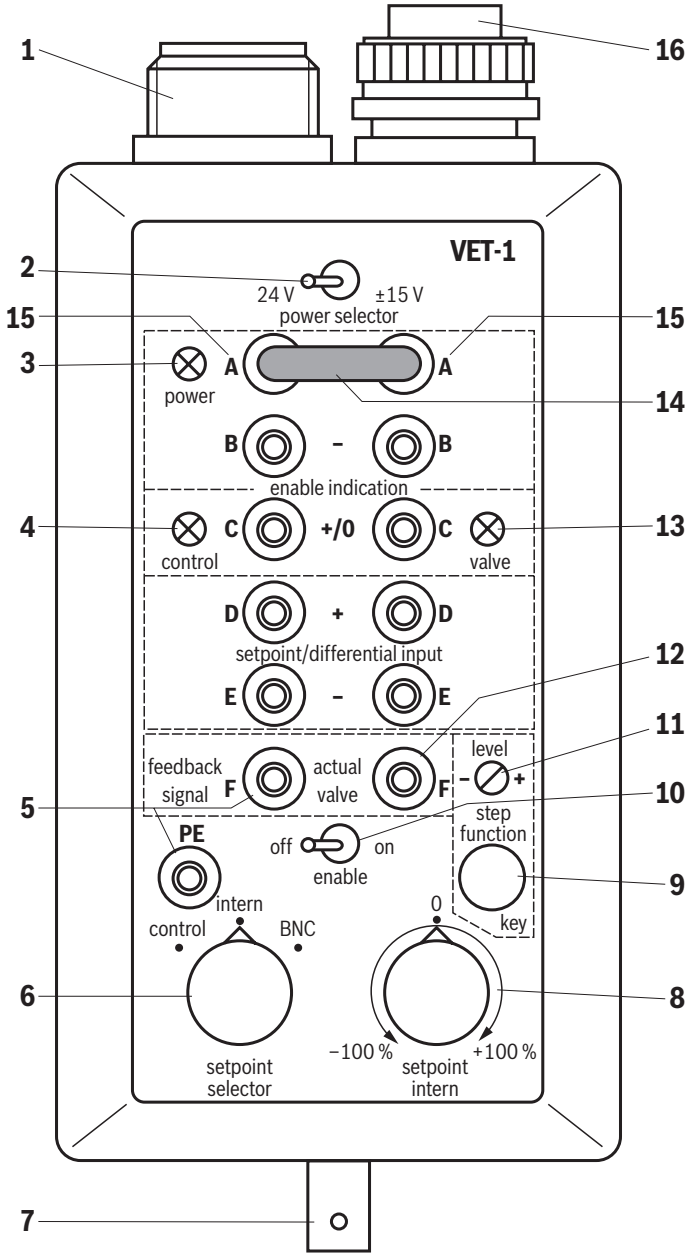
Designation	Spool position	Function
power selector	+24 V	The internal reference potential is connected to ES - pin B (0 V with U_B = 24 V).
		Using the "enable" switch, an enable signal can be generated ("on") or switched off ("off").
	±15 V	The internal reference potential is connected to ES - pin C (0 V with U_B = ±15 V).
		The enable signal generation is deactivated.
		ES - pin C is directly connected to AB - pin C (short-circuit bridge).
enable (only with 24 V operation)	on	"setpoint selector" switch to "control" position → An enable signal externally applied by the control (ES - pin C) is switched through.
		"setpoint selector" switch to "internal" or "BNC" position → The enable signal for the valve is set.
	off	There is a low-ohmic connection between the enable signal output (AB - pin C) and the reference potential (0 V).
setpoint selector	control	Via pin D and pin E, the command value lines are directly switched through from the control to the valve.
		If "power selector" switch to "24 V" position and "enable" switch to "on" position → The enable signal of the control is switched through to the valve (pin C).
	internal or BNC	"power selector" switch to "24 V" position → The enable signal to the valve corresponds to the "enable" switch position.
		The reference potential for the command value (AB - pin E) corresponds to the internal reference potential (0 V).
	internal	If the "stepfunction key" push-button is not operated → The command value signal to the valve (AB - pin D) corresponds to the specification by the "internal setpoint" command value potentiometer.
		If the "stepfunction key" push-button is operated → The command value signal to the valve (AB - pin D) corresponds to the specification by the "stepfunction level" trimmer.
	BNC	The signal applied at the BNC socket is switched through as command value signal to the valve (AB - pin D).

The described functions are only valid until all short-circuit bridges are plugged.

Push-buttons

Designation	Function	Prerequisites
stepfunction key	Switch-over between the "setpoint internal" and "stepfunction level" command value presettings (push-button operated)	Operating voltage available at the input connector ES. "power selector" spool position according to the operating voltage type "setpoint selector" switch to "internal"

Ports, display and adjustment elements



Item	Functional element	Labeling
1	Input connector ES: connection on the control side via connector K31, CM02E14S-61P	
2	Switch for selecting the operating voltage required by the valve	power selector
	LED displays:	
3	Ready for operation	power
4	Enable signal of the input connector ES and from the external control at pin C	enable indication control
5	Input measuring sockets	A to F and PE
6	Switch for the selection of the command value signal source	setpoint selector
7	BNC socket for connecting an external, independent command value encoder	
8	Potentiometer for setting the internal command value signal	setpoint internal
9	Shift key between the internal command value signals for generating a step signal	stepfunction key
10	Enable switch for generating an enable signal independent of the external control	enable
11	Trimmer for the amplitude adjustment of the internal step function generator	stepfunction level
12	Output measuring sockets for controlling the signals on the valve connection cable	A ... F
13	Enable signal at measuring sockets, output socket AB and pin C	enable indication valve
14	Short-circuit bridges for separating individual cable wires of the connection from control to the valve	
15	Designation for measuring sockets A to F	A to F
16	Output socket AB: valve-side connection via flange socket MS3108A-14S-6S	
17	Current/voltage output for valve command value with automatic switch-over between U_A = 0 V ... ±10 V or I_A = 0 ... ±20 mA	
18	Voltage converter DC/DC for the internal voltage supply	

☞ **Notice:**

- **Operating mode without enable input**
  Valves with integrated electronics and an operating voltage of +24 V without enable input use port C as reference potential for the actual valve value. In this case, the "enable" enable switch is to be set to "off" position.
- **Operating mode with enable input**
  Valves with integrated electronics and an operating voltage of +24 V with enable input use port B as reference potential for the actual valve value. In this case, the "enable" enable switch is to be set to "on" position.

Technical data

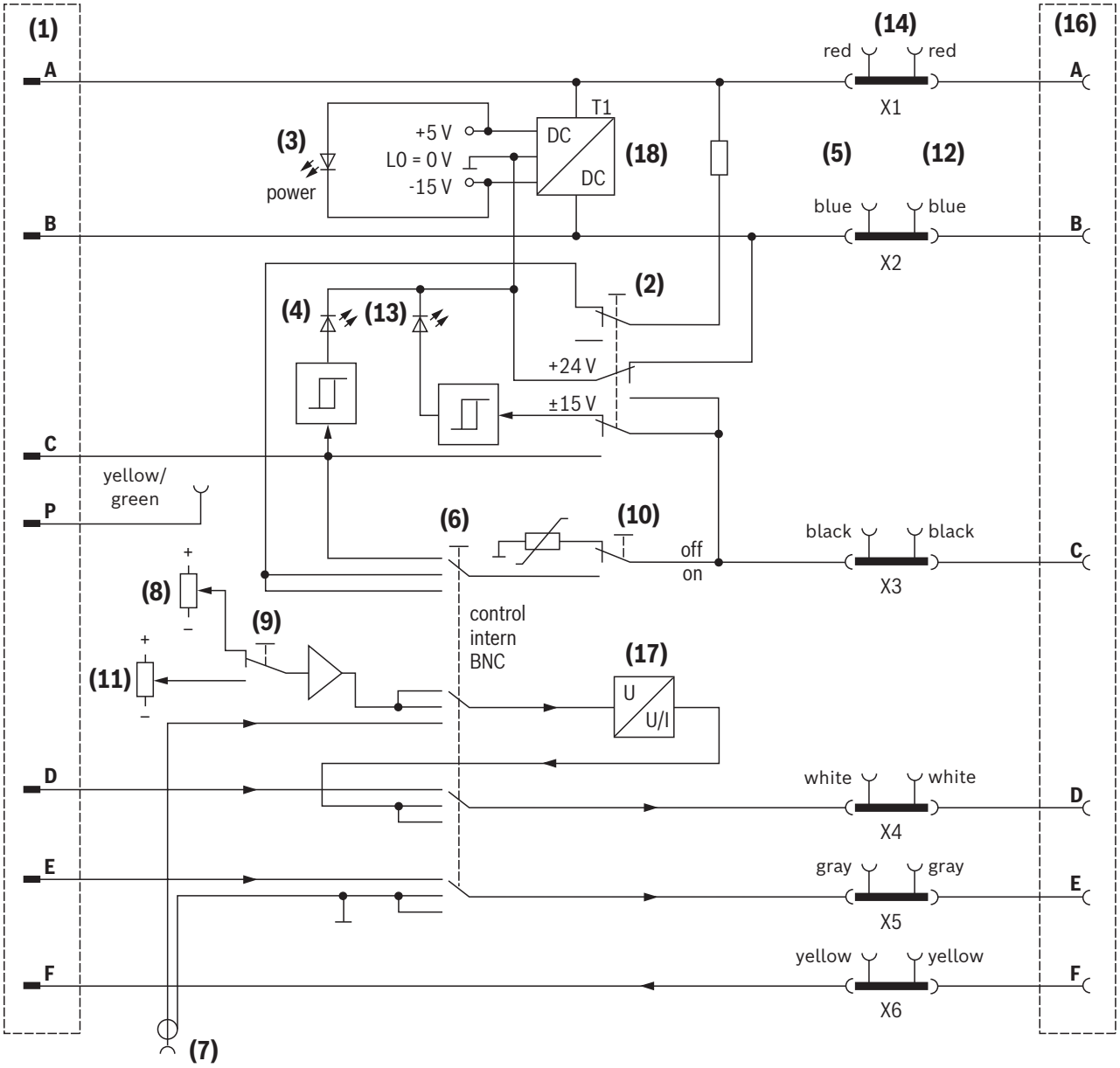
(For applications outside these values, please consult us!)

Operating voltages			
Switch "power selector"	▶ "24 V" spool position	V	24 $^{+40\%}_{-20\%}$
	▶ "±15 V" spool position	V	±15; ±10%
Current consumption of the test device		A	0.1
Maximum current carrying capacity of pin A and B of the input connector ES and the output socket AB when testing 24 V proportional or high-response valves		A	6

Inputs			
Input connector ES	▶ Command values at pin E and D		according to the valve specifications
	▶ Enable signal at pin C (24V operation)		
	– not active	V	0 ... 10
	– active	V	16 ... $\boldsymbol{U}_B$
Output socket AB	▶ Actual value at pin F		according to the actual value output of the valve
BNC socket		V	0 ... ±10

Output (all short-circuit bridges plugged)			
Input connector ES	▶ Actual value at pin F		according to the actual value output of the valve
Output socket AB	▶ Enable signal at pin C (24 V operation)		
	– "setpoint selector" switch; "internal" or "BNC" spool position; "enable" enable switch		
	– in "off" spool position	V	0
	– in "on" spool position		U_B
	– "control" spool position; "enable" enable switch		
	– in "off" spool position	V	0
	– in "on" spool position		according to pin C of the input connector ES
Command values at pin D and E	▶ "setpoint selector" switch		
	– "internal" or "BNC" spool position		
	– Pin E		Reference potential
	– Pin D	V	0 ... ±10, if $R_{e\ valve}$ > 500 Ω
		mA	0 ... ±20, if $R_{e\ valve}$ < 500 Ω
	▶ "control" spool position		
	– Pin E and D		according to the input connector ES (pin E and D)
Ambient temperature range		°C	0 ... +50
Protection class according to EN 60529			IP20
Dimensions (W x H x D)		mm	94 x 54 x 160
Weight		kg	0.36
Conformity			▶ CE according to EMC directive 2014/30/EU, tested according to EN 61326-2-1 and EN 61000326-1 ▶ RoHS directive 2011/65/EU

Block diagram / pin assignment



Pin assignment

Pin	Valve version with operating voltage **+24 V**	Valve version with operating voltage **±15 V**
A	+24 V	+15 V
B	0 V	-15 V
C	Enable or reference potential for the actual valve value, e.g. with 4WRSE	0 V
PE	Protective ground	Protective ground
D	Command value +	Command value +
E	Command value –	Command value –
F	Actual value	Actual value

Item explanations, see page 5.

Proportional servo valves suitable for testing

Valve type	Operating voltage U_B
Servo valves with integrated electronics (OBE)	
4WSE2EM6 (without electrical position feedback)	±15 V
4WSE2EM10(A)-4X (without electrical position feedback)	±15 V
4WSE2EE10(A)-4X	±15 V
4WSE2EM10-5X (without electrical position feedback)	±15 V
4WSE2ED10-5X	±15 V
4WSE2EM16(A) (without electrical position feedback)	±15 V
4WSE2ED16(A)	±15 V
4WSE3EE16	±15 V
4WSE3EE25	±15 V
4WSE3EE32	±15 V
4DSE1EO2 (without electrical position feedback)	±15 V
3DSE2EH10 (without electrical position feedback)	±15 V
Proportional and high-response valves with integrated electronics (OBE)	
4WRAE (without electrical position feedback)	+24 V
4WRBAE (without electrical position feedback)	+24 V
4WREE	+24 V
4WRPE	+24 V
4WRPEH	+24 V
4WRSE(H)	+24 V
4WRKE	+24 V
4WRBKE	+24 V
4WRLE	+24 V
4WRTE	+24 V
4WRGE	±15 V or +24 V
4WRDE	±15 V or +24 V
.WRCE	±15 V or +24 V
3FERE	+24 V
.WRZE (without electrical position feedback)	+24 V
DBEE (without electrical position feedback)	+24 V
DBEME (without electrical position feedback)	+24 V
DBEMTE (without electrical position feedback)	+24 V
DBETE (without electrical position feedback)	+24 V
DBETRE (without electrical position feedback)	+24 V
ZDBEE (without electrical position feedback)	+24 V
STW valves on request	±15 V or +24 V
DREE (without electrical position feedback)	+24 V

Accessories

Power supply unit type VT-VETNT-3-1X/G24
(included in the scope of delivery)

Table power supply unit 90 ... 264 VAC; +24 VDC, 3.75 A (Material no. **R900739627**)
The mains connector of the power supply unit is suitable for sockets in Germany and many European countries.
In some countries, a country-specific adapter has to be used (not included in the scope of delivery).

(Actual product may differ)

Technical data (For applications outside these parameters, please consult us!)		
Operating voltage	VAC	90 ...264; 47 ... 63 Hz
Current consumption	A	1.2
Fuse		electronic overload protection
Output voltage	VDC	24 ± 1 V; 3.75 A
Length of the mains line	m	approx. 1.5
Length of the line to the test device	m	approx. 1.5
Dimensions (W x H x D)	mm	139 x 61 x 36
Weight	kg	0.46

Connection cable type VT-VETK-1-1X (2 units included in the scope of delivery)

Connection cable between test device VT-VET-1-1X and proportional servo valves with integrated electronics (valves with ordering code "K9" and "K31" for the electrical connection) (material no. **R900575335**)

Technical data (For applications outside these parameters, please consult us!)		
Valve port		Mating connector according to DIN EN 175201-804
Test device port		Connector MS3101A 14S 6P
Length of the connection cable	m	3
Weight	kg	0.3

☞ **Notice:**
- For extension, several cables can be connected with each other.
- When operating valves with electrical connection "K31", the grounding conductor is interrupted.

Accessories

Adapter cable type VT-VETAK-1-1X (included in the scope of delivery)

Adapter cable between test device VT-VET-1-1X and proportional servo valves with integrated electronics (valves with ordering code "K17" for the electrical connection) (material no. **R900943189**)

Technical data (For applications outside these parameters, please consult us!)		
Valve port		Mating connector VG 95328
Test device port		Connector MS3101A 14S 6P
Length of the connection cable	m	3
Weight	kg	0.3