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## Elektrohydraulic Servovalves Typ HVM 090



### Special features:

- high reliability
- easy service
- robust construction
- high dynamic response
- relatively insensitive to contamination
- variable metering orifices only
- $Q_{max} = 70\text{ l/min}$  at  $\Delta p = 70\text{ bar}$
- $p_{max.} = 315\text{ bar}$

### General description:

|                   |   |                                                            |
|-------------------|---|------------------------------------------------------------|
| Type              | : | electrical input stage, torque motor, sliding spool system |
| Control           | : | torque motor actuated pilot spool                          |
| main spool        | : | located in 4-way sliding and correlated to the same        |
| Style of mounting | : | subplate / Cetop 05                                        |
| Mounting position | : | unrestricted                                               |
| Weight            | : | 2,8kg                                                      |

### Technical Data

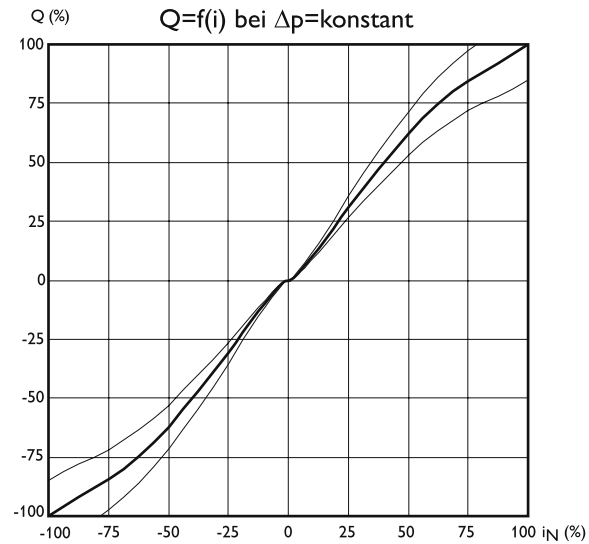
#### 1. Hydraulic Data (definition according to DIN 24311)

|       |                                                 |                |   |                                                                              |                                   |                                                                                     |
|-------|-------------------------------------------------|----------------|---|------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------|
| .1    | rated pressure                                  | $p_N$          | = | 210                                                                          | [bar]                             |                                                                                     |
| .2    | operating pressure                              | $p_{b \min}$   | = | 10                                                                           | [bar]                             | *in case of internal connection from L to T max.static pressure 10 bar continuously |
| .2.1  | return line pressure                            | $p_{b \max}$   | = | 315                                                                          | [bar]                             |                                                                                     |
| .2.2  | in case of separate leakage line                | $p_{r \max}$   | = | 35 % $p_b$ *                                                                 |                                   |                                                                                     |
|       |                                                 | $p_{L \max}$   | = | 10                                                                           | [bar]                             |                                                                                     |
| .3    | max. pressure (static test pressure)            | $p_{max}$      | = | 450                                                                          | [bar]                             |                                                                                     |
| .4    | rated flow at $\Delta p = 70\text{ bar}$        | $Q_N$          | = | 10/20/40/60/70                                                               | [l/min]                           |                                                                                     |
| .5    | quiescent flow, max. at $p_N$                   | $Q_{02}$       | < | 2% $Q_N$                                                                     |                                   |                                                                                     |
| .6    | internal max. leakage at $p_N = 210\text{ bar}$ | $Q_L$          | < | 50                                                                           | [cm <sup>3</sup> /min]            |                                                                                     |
| .7    | hysteresis                                      | H              | < | 5% $i_N$<br>3% $i_N$                                                         | (without Dither)<br>(with Dither) |                                                                                     |
| .8    | threshold sensitivity                           | E              | < | 0,5% $i_N$<br>0,2% $i_N$                                                     | (without Dither)<br>(with Dither) |                                                                                     |
| .9    | threshold span                                  | S              | < | 2% $i_N$<br>1% $i_N$                                                         | (without Dither)<br>(with Dither) |                                                                                     |
| .10   | linearity deviation                             |                | < | 10% $i_N$                                                                    |                                   |                                                                                     |
| .11   | flow symmetry - $Q_N$ zu + $Q_N$                |                | < | -10..+20% $i_N$                                                              |                                   |                                                                                     |
| .12   | pressure gain (see diagram)                     | $V_N$          | > | 0,3 $P_b$ / 1% $i_N$                                                         |                                   |                                                                                     |
| .13   | overlap, standard                               | h              | = | +3...+7% $i_N$                                                               |                                   |                                                                                     |
| .14   | operating temperature range                     | $\delta M$     | = | 253...353                                                                    | [K]                               |                                                                                     |
| .14.1 | temperature drift                               |                | ≤ | 2% $i_N$ / 50K                                                               |                                   |                                                                                     |
| .15   | viscosity range of fluid                        | $\gamma_{min}$ | = | 10...1000 mm <sup>2</sup> /s approximate value normal: ISO VG 10...ISO VG 46 |                                   |                                                                                     |
| .16   | filtration of fluid                             |                |   | class 4-5<br>class 15/14/11                                                  | to NAS 1638 or<br>to ISO 4406     |                                                                                     |
| .17   | fluid standard                                  |                | = | HLP-hydraulic oils as per DIN 51524 Teil 2 (Special equipments possible)     |                                   |                                                                                     |

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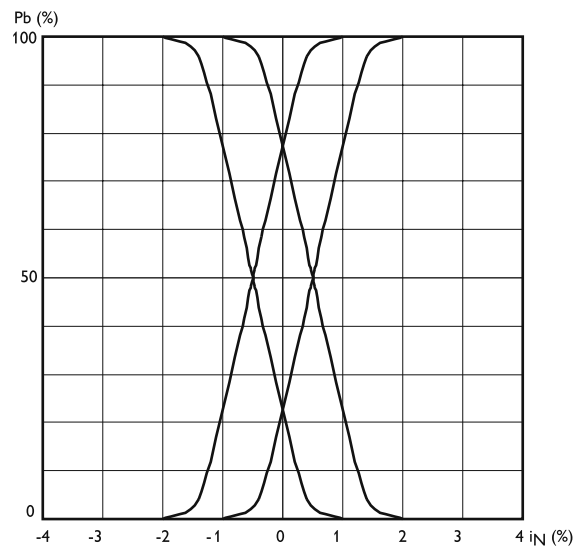
## 2. Diagrams HVM 090

Flow rate-signal function

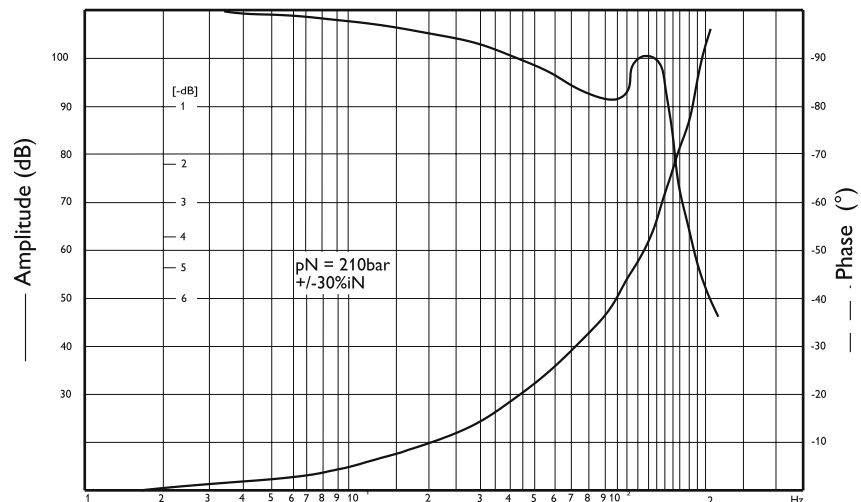


Pressure gain

$$V_p = \tan \alpha = \frac{\Delta p}{\Delta I}$$



Frequency Response



twisted pair cable up to cable length 25 mtr.:

Type LiYCY 3x2x0,5 mm<sup>2</sup> or LiYCY4x2X0,5mm<sup>2</sup>, if you will use the test signal out.

up to cable length 200 mtr.:

Type LiYCY 3x2x0,75 mm<sup>2</sup> or LiYCY 4x2x 0,75 mm<sup>2</sup>, if you will use the test signal out.

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## Order Information

# HVM 090 - 060 - 1200 - XX - E1

|                                 |  |
|---------------------------------|--|
| <b>Model</b>                    |  |
| 009                             |  |
| <b>Rated flow</b>               |  |
| QN at $\Delta p = 70$ bar       |  |
| 010 */min                       |  |
| 020 */min                       |  |
| 040 */min                       |  |
| 060 */min                       |  |
| 070 */min                       |  |
| <b>Seal material</b>            |  |
| 1 Perbunan                      |  |
| 2 Viton                         |  |
| 3 Buty*                         |  |
| 4 Vu*ko**an                     |  |
| 5 Ety*en-Propy*en               |  |
| <b>Resistance / coil [R20]</b>  |  |
| 1 11,5 $\Omega$                 |  |
| 2 60 $\Omega$                   |  |
| <b>Overlap</b>                  |  |
| 0 Zero over*ap                  |  |
| 1 Positiv over*ap               |  |
| 2 Negativ over*ap               |  |
| <b>Amount of overlap</b>        |  |
| positive or negative            |  |
| 1..9                            |  |
| <b>Design letter</b>            |  |
| assigned by manufacturer        |  |
| <b>Elektronic</b>               |  |
| E1 Vo*tage input F10V           |  |
| E2 Current input 4...20mA P > A |  |
| E3 Current input 4...20mA P > B |  |

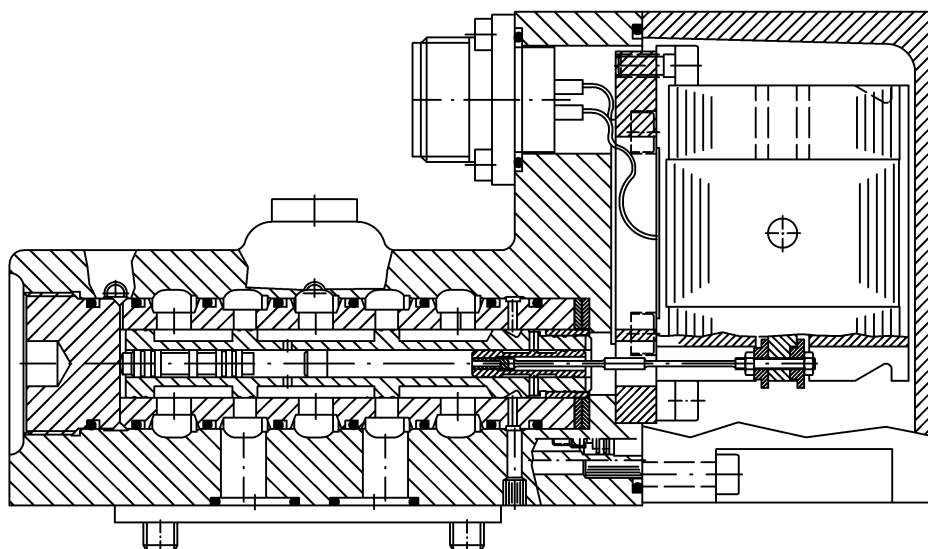
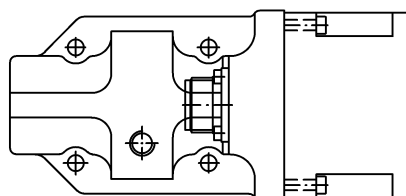
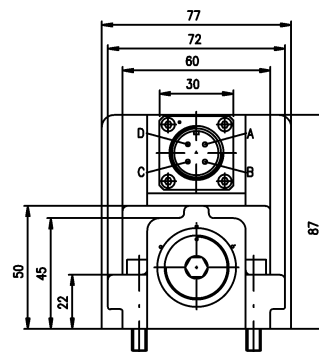
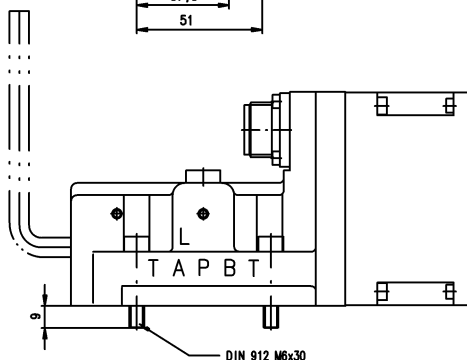
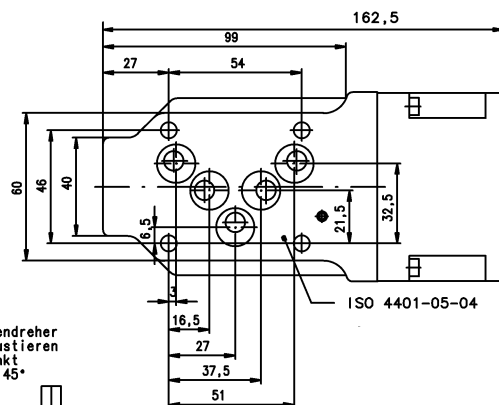
## 5. Accessories:

| Description     |       |                     | Order No. |
|-----------------|-------|---------------------|-----------|
| Connector       | 4po*. | CA 06 CO< E 14 S2S  | 13018     |
| Connector       | 7po*. | KE CA 06 CO< 14S 7S | 21855     |
| Sub p*ate       | NG 10 | HZ 036              | 39276     |
| scavenger p*ate | NG 10 | HZ 061              | 39686     |
| Box-Amp*ifier   |       | BOE XXX-025-0-5-0A  | 46965     |

## Important remarks:

Valve mounting surface must be flat within 0,02mm and smoothness not to exceed 6 $\mu$ m. Easy hydraulic Zero adjustment by means of Allen key S8 DIN 911. Max. permissible drain line pressure 10 bar. Valves with modified characteristics available. Modifications, which serve technical progress, remain reserving.

Sechskantschraubendreher  
DIN 911 s8 zum Justieren  
des hydr. Nullpunkt  
Justagebereich  $\pm 45^\circ$



Angaben ohne Einheiten in mm  
All dimensions without unit in mm

Nur zur Information / Only for information

| Änderungsindex / Amendment index |               |              |
|----------------------------------|---------------|--------------|
|                                  | Datum<br>Date | Name<br>Name |
| dwg.                             | 17.09.01      | Dindorf      |

Ventil  
Valve  
**HVM 090-XXX-XXXX-XX**

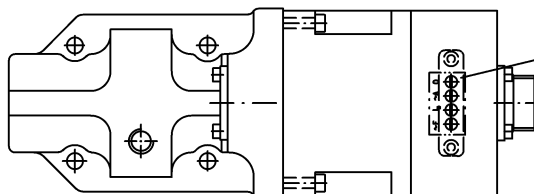
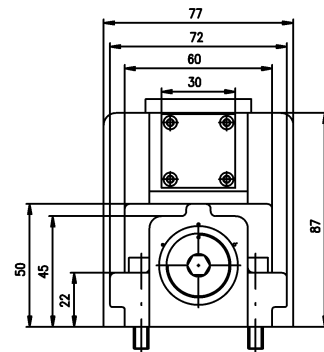
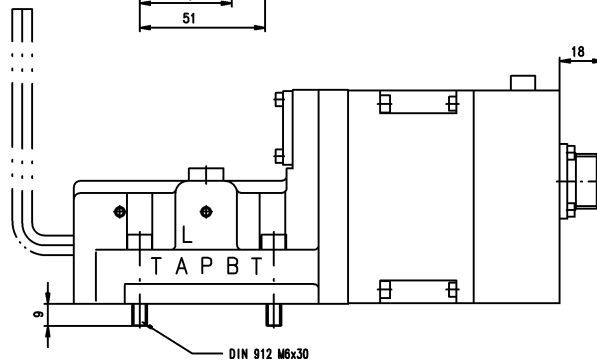
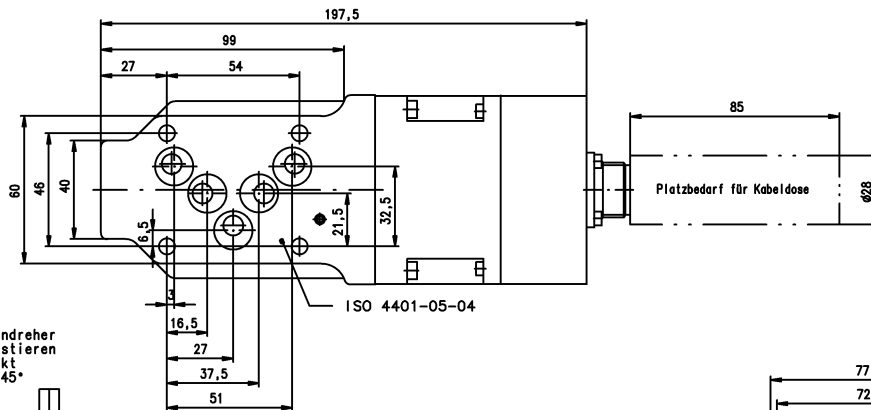
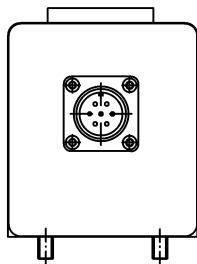
Id.-Nr.  
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Ringstr. 132 55543 Bad Kreuznach  
Germany

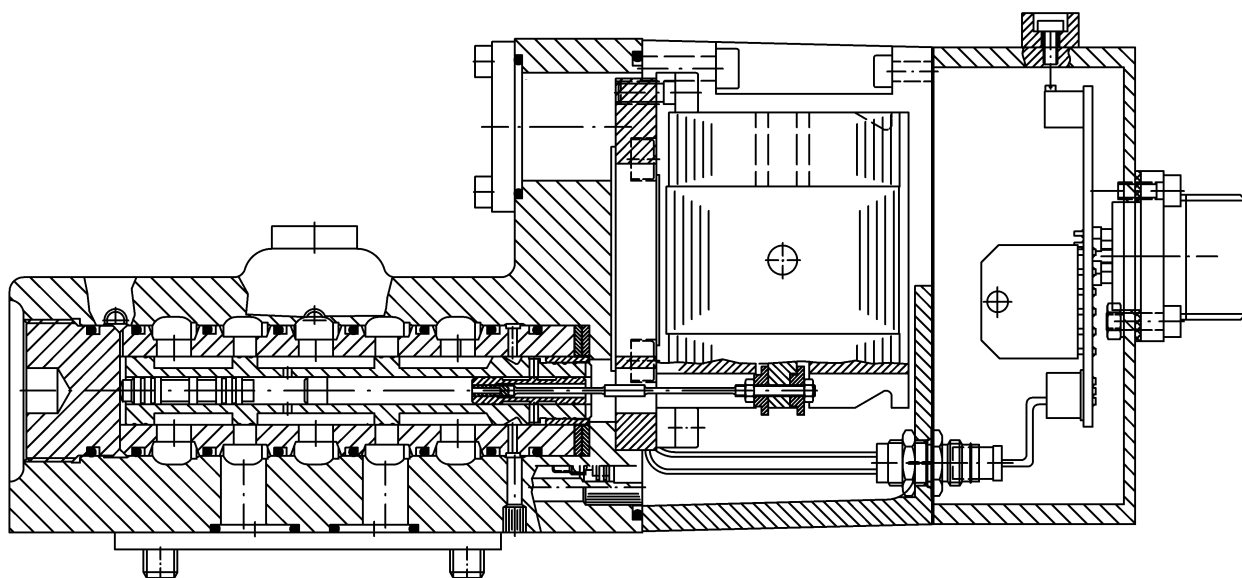
|   |                 |
|---|-----------------|
| A | 24 VDC ; 400 mA |
| B | 0 V             |
| C | Signal 0        |
| D | ± 10 V          |
| E | 0 V             |
| F | Feedback        |
| G | PE $\equiv$     |

Sechskantschraubendreher  
DIN 911 s8 zum Justieren  
des hydr. Nullpunkt  
Justagebereich ± 45°



Einstellpotis Ventilelektronik

~F: Ditherfrequenz  
I: Nennstrom  
~A: Ditheramplitude  
0: Nullpunkt



Angaben ohne Einheiten in mm  
All dimensions without unit in mm

Nur zur Information / Only for information

| Änderungsindex / Amendment index |               |              |
|----------------------------------|---------------|--------------|
|                                  | Datum<br>Date | Name<br>Name |
| dwg.                             | 17.09.01      | Dindorf      |

Ventil  
Valve  
**HVM 090-XXX-XXXX-XX-EX**

Id.- Nr.

—



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