

## 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

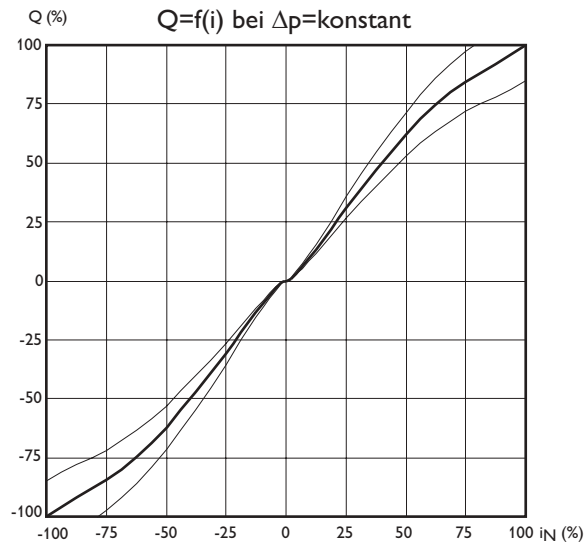
### Technical Data

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

.1	rated pressure	$p_N$	=	210	[bar]	
.2	operating pressure	$p_{b \text{ min}}$	=	10	[bar]	*in case of internal connection from L to T max.static pressure 10 bar continuously
		$p_{b \text{ max}}$	=	315	[bar]	
.2.1	return line pressure	$p_{r \text{ max}}$	=	35 % $p_b$ *		
.2.2	in case of separate leakage line	$p_{L \text{ max}}$	=	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% $i_N$ 3% $i_N$	(without Dither) (with Dither)	
.8	threshold sensitivity	E	<	0,5% $i_N$ 0,2% $i_N$	(without Dither) (with Dither)	
.9	threshold span	S	<	2% $i_N$ 1% $i_N$	(without Dither) (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 class 15/14/11	to NAS 1638 or to ISO 4406	
.17	fluid standard		=	HLP-hydraulic oils as per DIN 51524 Teil 2 (Special equipments possible)		

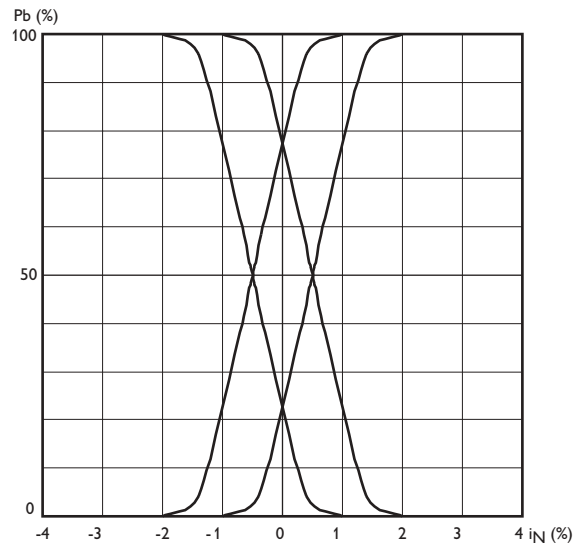
## 2. Diagrams HVM 090

Flow rate-signal function

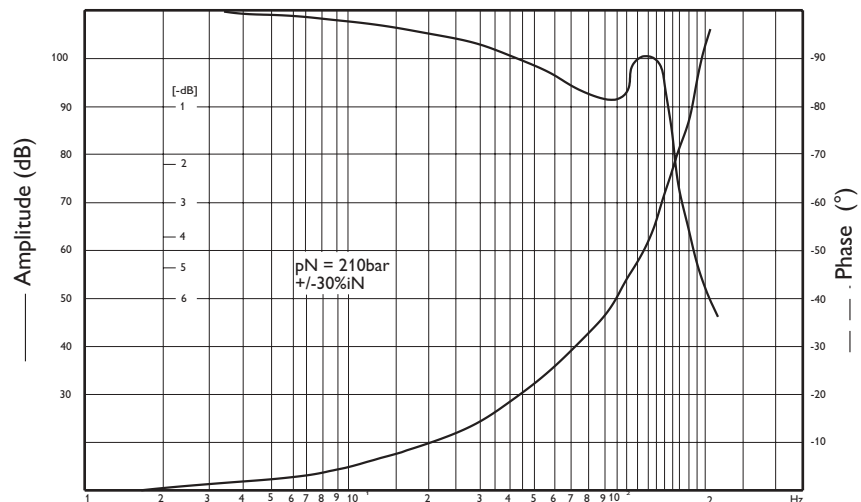


Pressure gain

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



Frequency Response



## 3. Electrical Data

### 3.1 Electrical Data without Electronic

A or C +V D or B 0V flow from P to B					Standard version coils parallel A+C: +V, D+B: 0V flow from P to B					Special equipment Coils serially A: +V, B: 0V flow from P to B					Special equipment A,B to C > A,B to D: flow from P to A				
coil type	inductance / coil	rated current	resistance	power	rated current	resistance	power	rated current	resistance	power	rated current	resistance	power						
1	86 mH	± 325 mA	11,5Ω	1,35 W	± 650 mA	6 Ω	2,7 W	± 325 mA	23 Ω	2,7 W	650 mA	11,5Ω	5,4 W						
2	320 mH	± 150 mA	60 Ω	1,35 W	± 300 mA	30 Ω	2,7 W	± 150 mA	120 Ω	2,7 W	300 mA	60 Ω	5,4 W						

### .2.1 Electrical Data with Electronic

Power supply: 24V DC (18V ... 28V)  
 Current: 350mA max.  
 Input signal: -10V ... 0,0 ... +10V  
 Input resistance: 100 kohm  
 Signal direction: from Pin D to Pin E  
 Internal coil current: 300mA ... 0mA ... -300mA  
 Test signal output: 3Volt ... 0V ... -3 Volt  
 Valve oil flow: 100% ... 0% ... -100%  
 Flow direction: +10V = P > A and B > T  
 0,0V = Valve closed  
 -10V = P > B and A > T

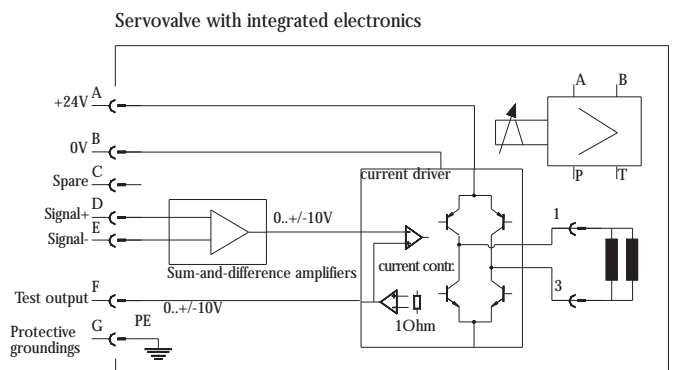
#### Reminds:

To avoid potential drifting problems, connect Pin E with low resistance (< 10 ohm) to Pin B.  
 The electrical-hydraulic working direction can be changed to reversed connection on Pin D and Pin E

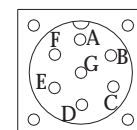
#### Cable recommendation:

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.

### .2.2 Bloc diagram



connector 7 pol.  
DIN 43563



View on the valve  
Pins visible

**Order Information**

## HVM 090 - 060 - 1200 - XX - E1

<b>Model</b>	
090	
<b>Rated flow</b>	
QN at $\Delta p = 70$ bar	
010 l/min	
020 l/min	
040 l/min	
060 l/min	
070 l/min	
<b>Seal material</b>	
1 Perbunan	
2 Viton	
3 Butyl	
4 Vulkollan	
5 Ethylen-Propylen	
<b>Resistance / coil [R20]</b>	
1 11,5 $\Omega$	
2 60 $\Omega$	
<b>Overlap</b>	
0 Zero overlap	
1 Positiv overlap	
2 Negativ overlap	
<b>Amount of overlap</b>	
positive or negative	
1..9	
<b>Design letter</b>	
assigned by manufacturer	
<b>Elektronik</b>	
E1 Voltage input $\pm 10V$	
E2 Current input 4...20mA P > A	
E3 Current input 4...20mA P > B	

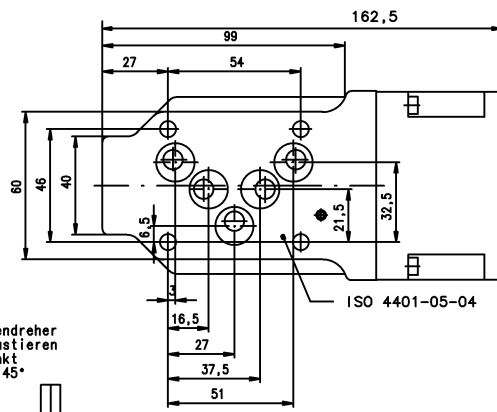
**5.Accessories:**

Description			Order No.
Connector	4pol.	CA 06 COM E 14 S2S	13018
Connector	7pol.	KE CA 06 COM 14S 7S	21855
Sub plate	NG 10	HZ 036	39276
scavenger plate	NG 10	HZ 061	39686
Box-Amplifier		BOE XXX-025-0-5-0A	46965

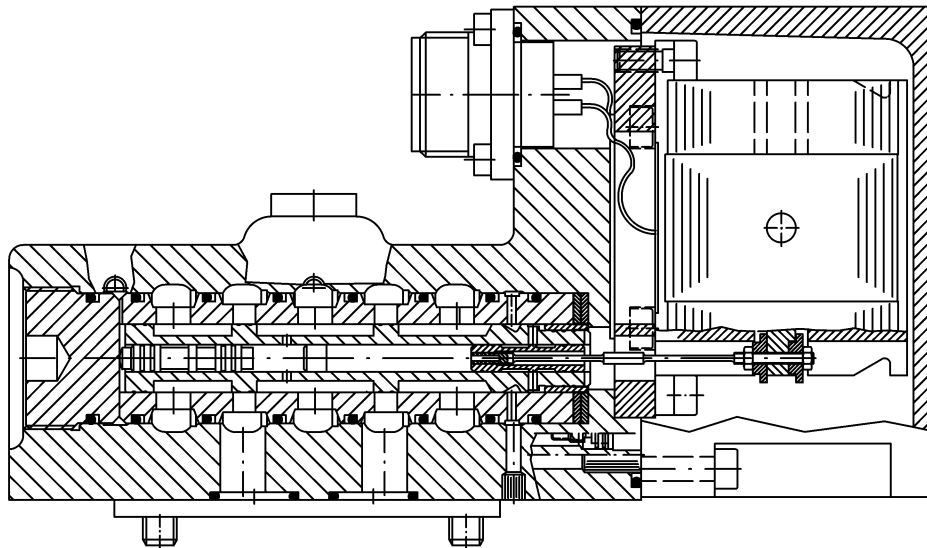
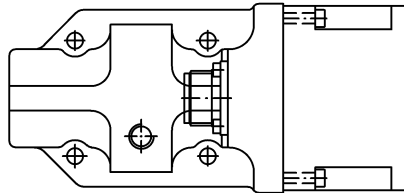
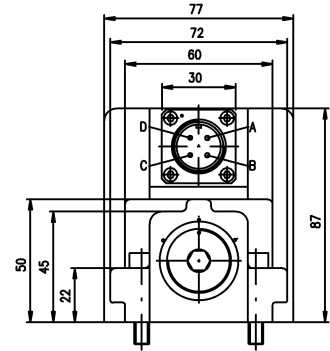
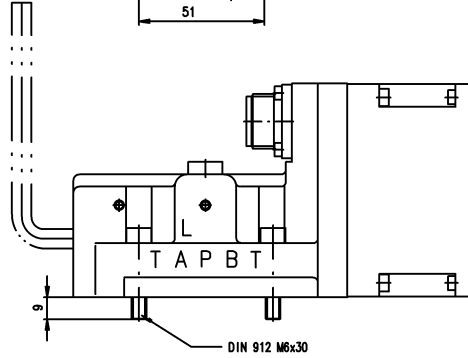
**Important remarks:**

**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.**

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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 Date	Name Name	
dwg.	17.09.01	Dindorf

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

Id.- Nr.  
-

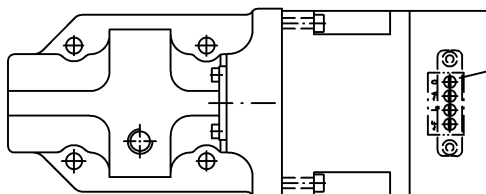
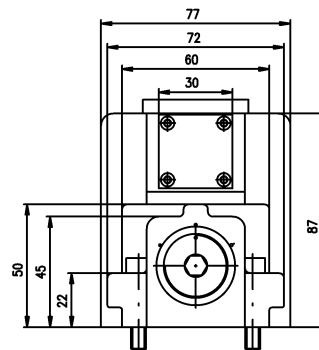
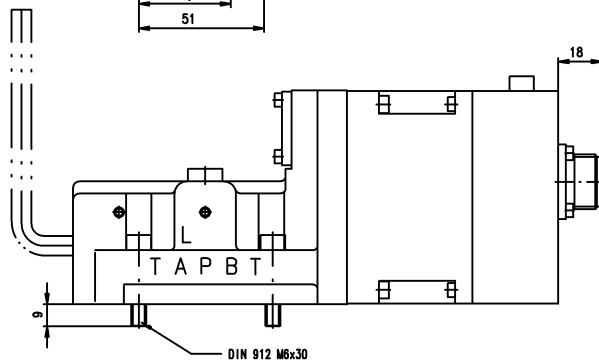
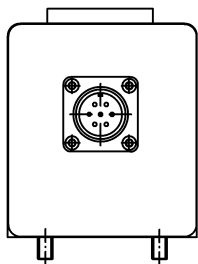
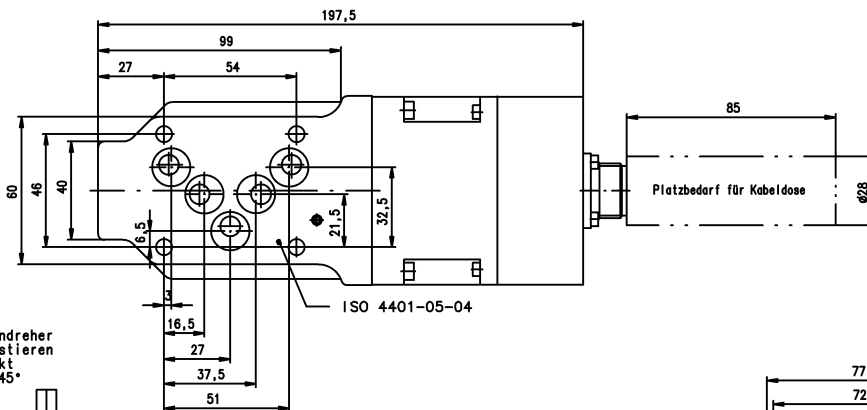
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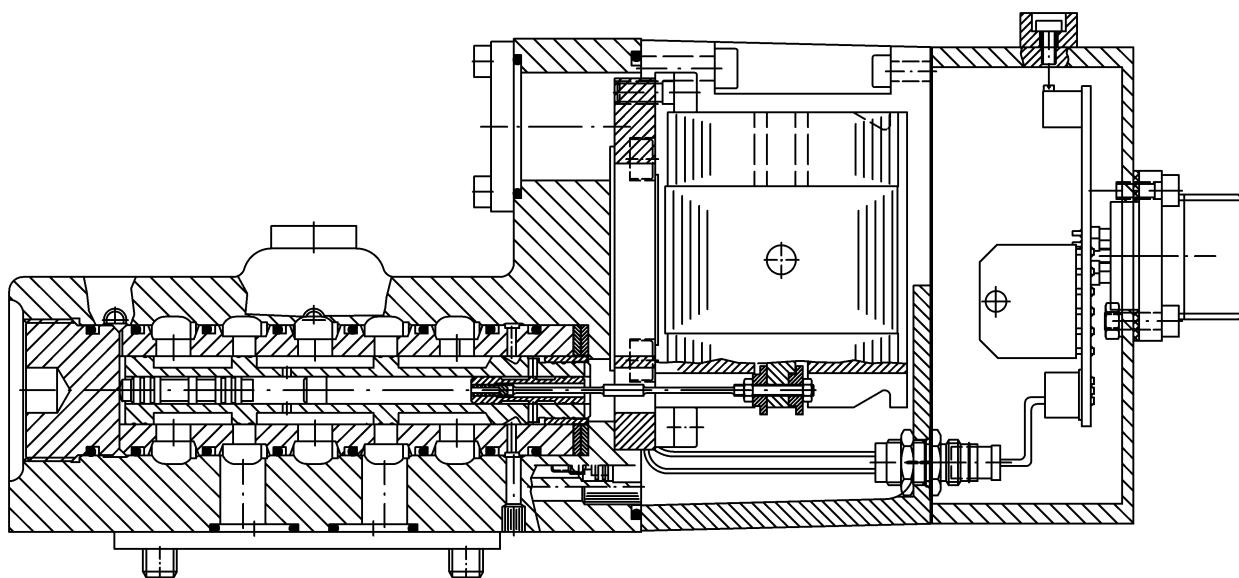
A	24 VDC ; 400 mA
B	0 V
C	Signal 0
D	± 10 V
E	0 V
F	Feedback
G	PE $\equiv$

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 Date	Name Name	
dwg.	17.09.01	Dindorf

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

Id.- Nr.  
-

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