HIPERDRIVE® HRA25, HRA35 and HIPERDRIVE®-HUB: Integrated positioning system with absolute distance measurement for format adjustment.

DATA SHEET

Benefits for the user:

- No reference movements required due to integrated absolute encoder
- Little space required due to motor, power electronics and gearbox in one housing
- Easy mounting using jog keys
- System always up-to-date due to high number of equipment options

HIPERDRIVE®-HUB is the ideal component for connecting several drives to a field bus system

Benefits for the user

- Simple bus structure: only one bus node for up to 8 drives
- Low cabling requirement: only one cable to the drive
- Cost saving due to fewer cables and bus nodes

Torque
1 ... 12 Nm
Format adjustment drive

HIPER® DRIVE by SICK|STEGMANN

Modern logistics concepts require smaller batch sizes in many production areas. Thus, in production facilities, product changeovers necessitate a variety of settings. With the HIPERDRIVE®, setups on so-called auxiliary axes can be achieved efficiently, cost-effectively and with high accuracy.

SICK|STEGMANN

01-2008

Torque
1 ... 12 Nm

Format adjustment drive

- Device Variant for connection to HIPERDRIVE®-HUB
- Easy handling and operation
- Protection of mechanical machine elements from damage

CE

1 Cable adapter with preassembled connection cable to be ordered separately (page 13).

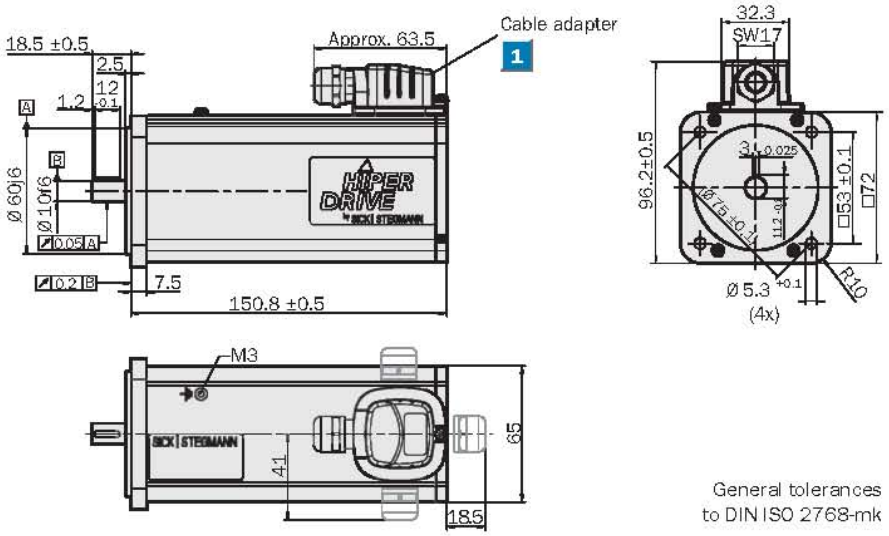
Version output shaft	H10	H12
Dimension **A**	Ø 10_{H7}	Ø 12_{F7}
Dimension **B**	$11.4^{+0.1}$	$13.8^{+0.1}$
Dimension **C**	3_{H7}	4_{H7}

Accessories

Connection systems

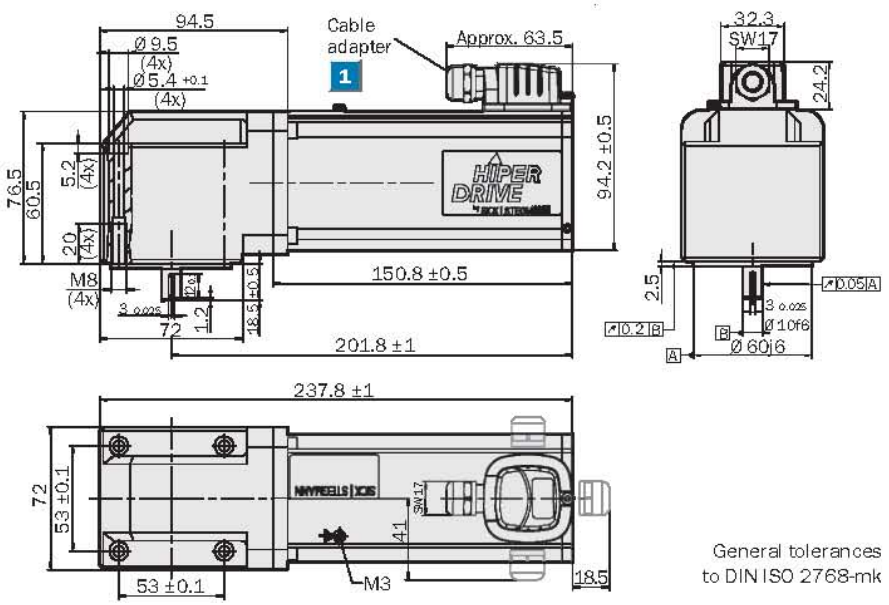
HIPERDRIVE®-HUB

Dimensional drawing HIPERDRIVE® HRA25, HRA35, for HIPERDRIVE®-HUB with shaft output axial



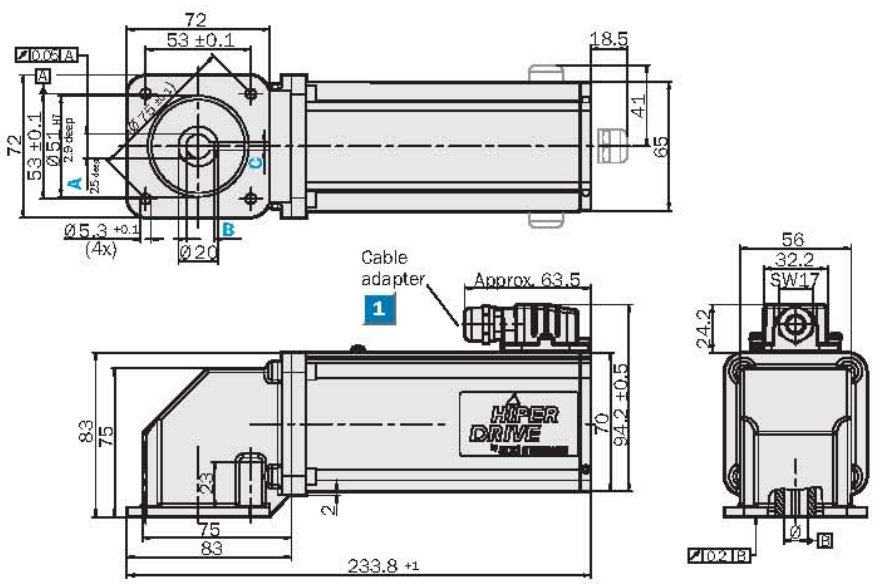
General tolerances to DIN ISO 2768-mk

Dimensional drawing HIPERDRIVE® HRA25, HRA35, for HIPERDRIVE®-HUB with shaft output radial



General tolerances to DIN ISO 2768-mk

Dimensional drawing HIPERDRIVE® HRA25, HRA35, for HIPERDRIVE®-HUB with blind hollow shaft output radial



General tolerances to DIN ISO 2768-mk

Technical Data HIPERDRIVE® HRA25, HRA35 for HIPERDRIVE®-HUB	HUB							
Motor versions	**HRA35x**				**HRA25x**			
Nominal power output [1]	35 W				25 W			
Nominal voltage	24 ± 15 % VDC				24 ± 15 % VDC			
Nominal current	3 A				2.2 A			
Maximum current	4.5 A				3.5 A			
Gearbox versions	I	II	III	IV	I	II	III	IV
Nominal torque	1.2 Nm	4.5 Nm	7.1 Nm	9.3 Nm	0.85 Nm	3.2 Nm	5 Nm	6.6 Nm
Nominal speed	280 upm	75 upm	46 upm	36 upm	280 upm	75 upm	46 upm	36 upm
Lowest possible speed	84 upm	22 upm	14 upm	11 upm	84 upm	22 upm	14 upm	11 upm
Maximum torque [1]	1.4 Nm	5.5 Nm	9 Nm	12 Nm	1 Nm	3.9 Nm	6.4 Nm	8.6 Nm
Minimum holding torque [2]	1.4 Nm	5.5 Nm	9 Nm	12 Nm	1 Nm	3.9 Nm	6.4 Nm	8.6 Nm
Static holding torque, currentless (min.)	0.5 Nm	3.5 Nm	4.5 Nm	5 Nm	0.5 Nm	3.5 Nm	4.5 Nm	5 Nm
Type versions								
Type E								
Number of steps per revolution	16	16	16	16	16	16	16	16
Number of revolutions	64	64	64	64	64	64	64	64
Jog button available	no	no	no	no	no	no	no	no
Positioning accuracy typ.	± 15°	± 15°	± 15°	± 15°	± 15°	± 15°	± 15°	± 15°
Type B								
Number of steps per revolution	128	128	128	128	128	128	128	128
Number of revolutions	128	128	128	128	128	128	128	128
Jog button available	yes	yes	yes	yes	yes	yes	yes	yes
Positioning accuracy typ.	± 5.0°	± 5.0°	± 5.0°	± 5.0°	± 5.0°	± 5.0°	± 5.0°	± 5.0°
Type A								
Number of steps per revolution	1024	1024	1024	1024	1024	1024	1024	1024
Number of revolutions	1024	1024	1024	1024	1024	1024	1024	1024
Jog button available	yes	yes	yes	yes	yes	yes	yes	yes
Positioning accuracy typ.	± 4.0°	± 1.8°	± 1.5°	± 1.4°	± 4.0°	± 1.8°	± 1.5°	± 1.4°
Mechanical Data								
Shaft output axial								
Permissible shaft loading axial (max.)	150 N							
Permissible shaft loading radial (max.)	200 N							
Weight	2.0 kg							
Shaft output radial – angular gear with solid shaft								
Permissible shaft loading axial (max.)	165 N							
Permissible shaft loading radial (max.)	440 N							
Gear backlash	< 0.5°							
Weight	3.2 kg							
Shaft output radial – angular gear with hollow shaft								
Permissible shaft loading axial (max.)	150 N							
Permissible shaft loading radial (max.)	150 N							
Gear backlash	< 3.5°							
Weight	2.8 kg							
Ambient conditions								
Undervoltage detection	< 16 VDC							
Overtemperature disconnection	100 °C							
Working temperature range	0 ... + 60 °C							
Storage temperature range	– 25 ... + 75 °C							
Permissible relative humidity [3]	90 %							
EMC [4]								
Resistance								
to shocks [5]	30/5 g/ms							
to vibration [6]	10/10 ... 150 g/Hz							
Protection to IEC 60529 (Outputshaft covered)	IP 65							

[1] 10 min. at 20 °C ambiente temperature

[2] With a factory set quiscent current of 350 mA

[3] Condensation not permitted

[4] To EN 61000-6-2 and EN 61000-6-4

[5] To EN 60068-2-27

[6] To EN 60068-2-6

Torque
1 ... 12 Nm

Format adjustment drive

- Profibus DP interface
- DeviceNet interface
- Easy handling and operation
- Protection of mechanical machine elements from damage

CE

1 M20 cable gland for voltage supply

2 2x M16 cable gland for Bus cable

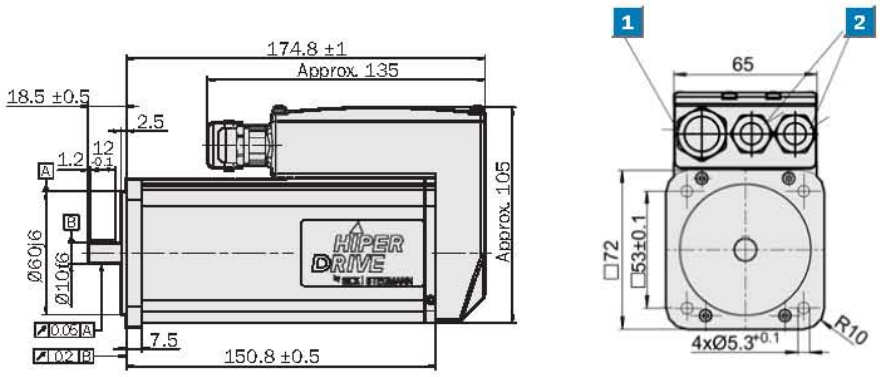
Version output shaft	H10	H12
Dimension **A**	Ø 10_{H7}	Ø 12_{F7}
Dimension **B**	$11,4^{+0,1}$	$13,8^{+0,1}$
Dimension **C**	3_{H7}	4_{H7}

Accessories

Connection systems

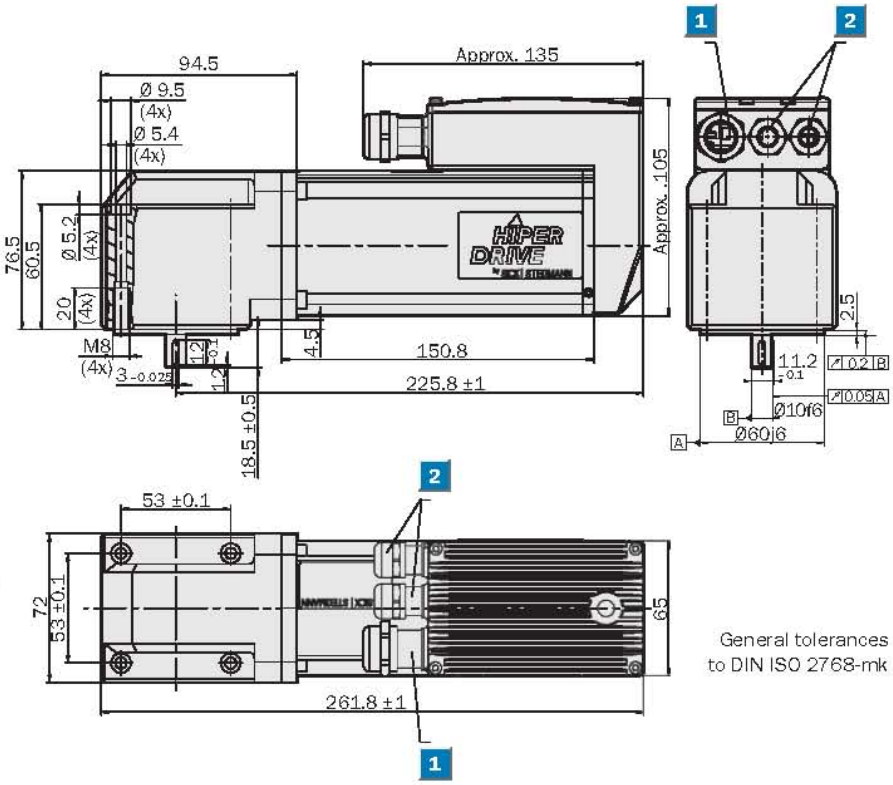
HIPERDRIVE®-HUB

Dimensional drawing HIPERDRIVE® HRA25, HRA35, Profibus DP and DeviceNet with shaft output axial



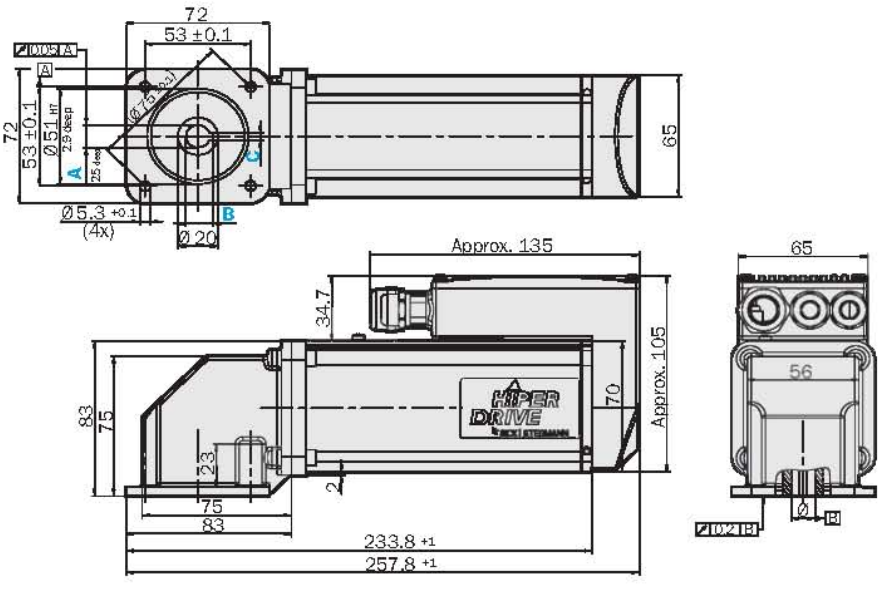
General tolerances to DIN ISO 2768-mk

Dimensional drawing HIPERDRIVE® HRA25, HRA35, Profibus DP and DeviceNet with shaft output radial



General tolerances to DIN ISO 2768-mk

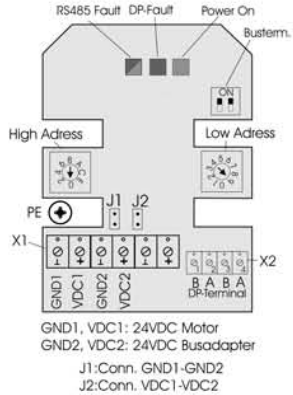
Dimensional drawing HIPERDRIVE® HRA25, HRA35, Profibus DP and DeviceNet with blind hollow shaft



General tolerances to DIN ISO 2768-mk

Profibus DP data exchange – Connecting systems and controls

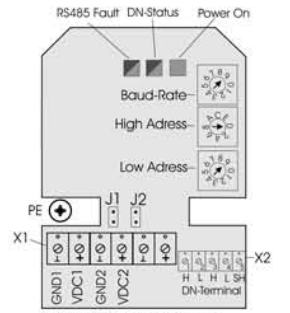
- Cyclic data traffic, control functions and condition messages according to PROFIBUS profile PROFIDRIVE V2.0.
- PPO type with fixed data length for HIPERDRIVE®
- Process data (PZD) for control commands and condition messages, transmission of nominal and actual values for position, speed and torque.
- Parameter processing via PKW mechanism in cyclic data traffic.
- Parameters for zero position or offset of absolute position, mode, determining the limit values (position limit switches, speed, torque), jog mode, status information, details about warnings and faults, device ID.



GND1, VDC1: 24VDC Motor
GND2, VDC2: 24VDC Busadapter
J1:Conn. GND1-GND2
J2:Conn. VDC1-VDC2

DeviceNet data exchange – Connecting systems and controls

- DeviceNet Group 2 Only Server supports a "Predefined Master Slave Connection Set".
- Cyclic data transfer for time-critical process data (8 byte for set- and actual position, speed and torque-limit values as well as control- and status word) with **I/O polling mode**.
- Parameters for zero position or offset of absolute position, mode, determining the limit values (position limit switches, speed, torque), jog mode, status information, details about warnings and faults, device ID.
- Parameter processing via **Explicit Messaging** data transfer.



GND1, VDC1: 24VDC Motor
GND2, VDC2: 24VDC Busadapter
J1:Conn. GND1-GND2
J2:Conn. VDC1-VDC2

Technical Data to DIN 32878 HRA25, HRA35x	Profibus DP	DeviceNet
Communication for all HRA25x and HRA35x variants	9.6; 19.2; 45.45; 93.75; 187.5; 500; 1500; 3000; 6000; 12000 kBd	125; 250; 500 kBd
Baud rates supported		
Properties	DP-Slave	Group 2 Only Server
Address range	00 ... 127	00 ... 63
Bus termination resistor	Can be switched in internally	To be externally added
Voltage supply, bus adapter	24 VDC (min. 10 V, max. 30 V)	24 VDC (min. 10 V, max. 30 V)
Power consumption bus adapter	150 mA (typ.)	150 mA (typ.)
Connection motor supply/bus adapter	Terminal strip 4 x 2.5 mm, PE: screw lug M3	Terminal strip 4 x 2.5 mm, PE: screw lug M3
Connection, Bus	Terminal strip 4 x 1 mm²	Terminal strip 4 x 1 mm²

Order information

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
H	R	A				–									

Drive

- Integrated rotative positioning drive = **H**
- Brushless DC motor with non selflocking gearbox = **R**
- Absolute Measuring system = **A**

Mechanical output power at output shaft

- 25 W = **25**
- 35 W = **35**

Type (see technical data page 3)

- **E**
- **B**
- **A**

Nominal speed (rpm)

- 36 rpm = **036**
- 46 rpm = **046**
- 75 rpm = **075**
- 280 rpm = **280**

Type output shaft

- Solid shaft with key = **S**
- Hollow shaft with key way = **H**

Output shaft diameter

- 10 mm = **10**
- 12 mm (only with hollow shaft) = **12**

Direction of the output shaft in relation to the cable (with radial shaft output)

- Axial (only with solid shaft) = **0**
- Radial, Position Type 1, "6 o'clock position" = **1**
- Radial, Position Type 2, "9 o'clock position" = **2**
- Radial, Position Type 3 "12 o'clock position" = **3**
- Radial, Position Type 4, "3 o'clock position" = **4**

Elektrical Interface

- HIPERDRIVE®-HUB = **HH**
- Profibus DP = **DP**
- DeviceNet = **DN**

Order example

HIPERDRIVE® HRA with 35 W output power, type E, nominal speed 36 rpm, solid shaft 10 mm, shaft output axial with Profibus DP interface

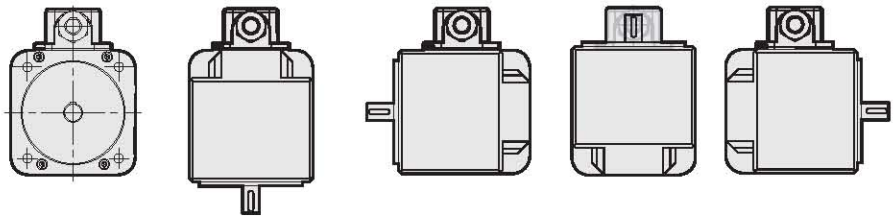
Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
H	R	A	3	5	E	–	0	3	6	S	1	0	0	D	P

Please enter your individual format adjustment drive here

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
H	R	A				–									
H	R	A				–									
H	R	A				–									

Shaft output

axial | radial Pos.* Type 1 | radial Pos.* Type 2 | radial Pos.* Type 3 | radial Pos.* Type 4



* Examples shown are for angle drive with solid shaft, versions with hollow shaft follow the same format

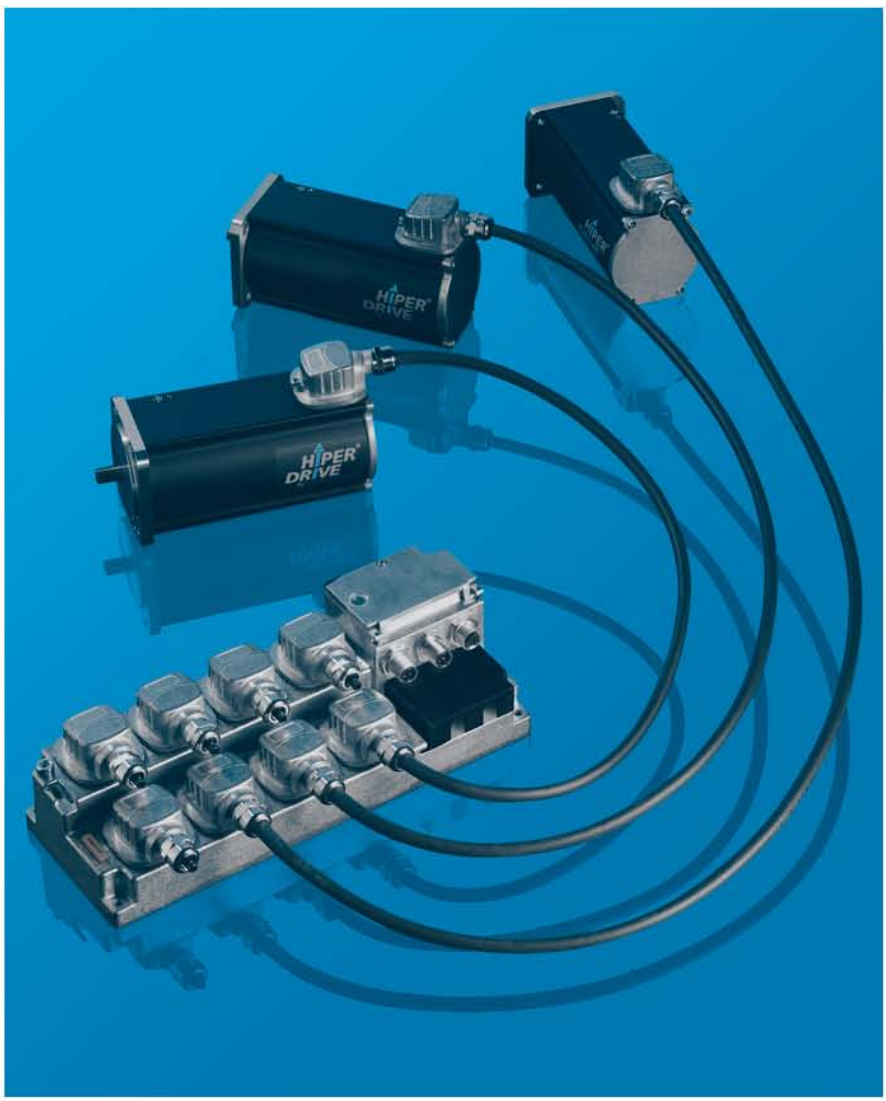
General

A system using HIPERDRIVE®-HUB offers reduced system costs, less cabling and optimisation of the DP addresses in the Profibus network. In addition, it offers space saving on the machine and in the control cabinet.

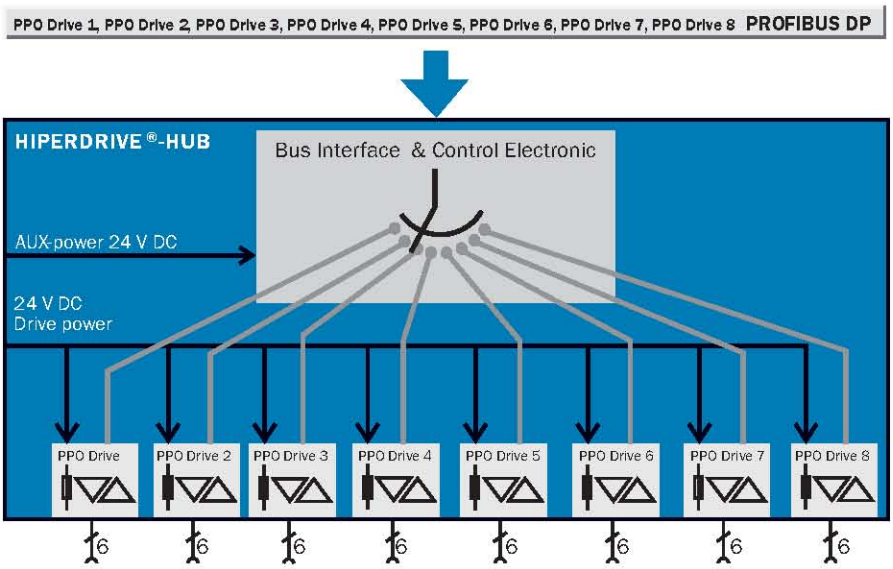
The new HIPERDRIVE®-HUB adds further benefits in terms of costs and data technology to the list of arguments for HIPERDRIVE® drives. The hub enables the integration of up to eight HIPERDRIVE® units within a Profibus environment. This reduces the cabling and, above all, the system costs – depending on the configuration – by more than 40 %.

HIPERDRIVE®-HUB is the central connecting station for up to eight HIPERDRIVE® drives. The Bus Interface and Control module within the hub makes it possible to address all drives connected, via a single DP address. Moreover, HIPERDRIVE®-HUB ensures distribution of the operating voltage for the drives. This means that not two or three but only one cable with a maximum length of 20 metres will be required for the connection of a drive. The data and the driving power are transmitted in the same cable. Apart from the field bus and the 24 V motor supply, the HIPERDRIVE®-HUB itself only requires a 24 V auxiliary supply for the Bus Interface and Control module.

In addition to the HRA25- and HRA35 drives described here, other HIPERDRIVE® drives (e.g. HDA30 and HDA45) can of course operate in any configuration on the HIPERDRIVE®-HUB.



Functional diagram



Assembly

HIPERDRIVE®-HUB can be centrally mounted on the machine bed and does not need to be enclosed inside terminal boxes or control cabinets. If during installation a bus master is not yet available, the function of the drive installation can be checked very easily using the controls integrated in the HIPERDRIVE®-HUB.

Programming

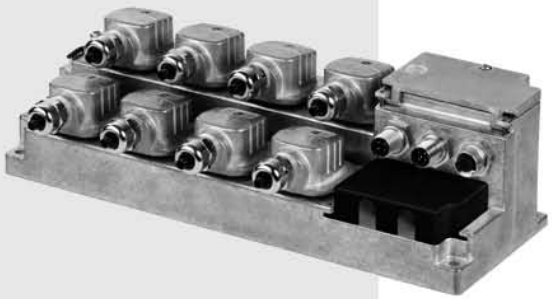
The data structure, of drives with integrated Profibus, is identical to that used in the devices which use a separate bus module. Subsequent conversion to a HUB configuration only requires reconfiguration of the master. The user program can be adopted without changes.

Numerous accessories simplify the installation and thus contribute to reducing the system costs.

Torque
1 ... 12 Nm

Format adjustment drive

- Power distribution and data management for a maximum of 8 drives
- Easy handling and operation
- Profibus DP interface



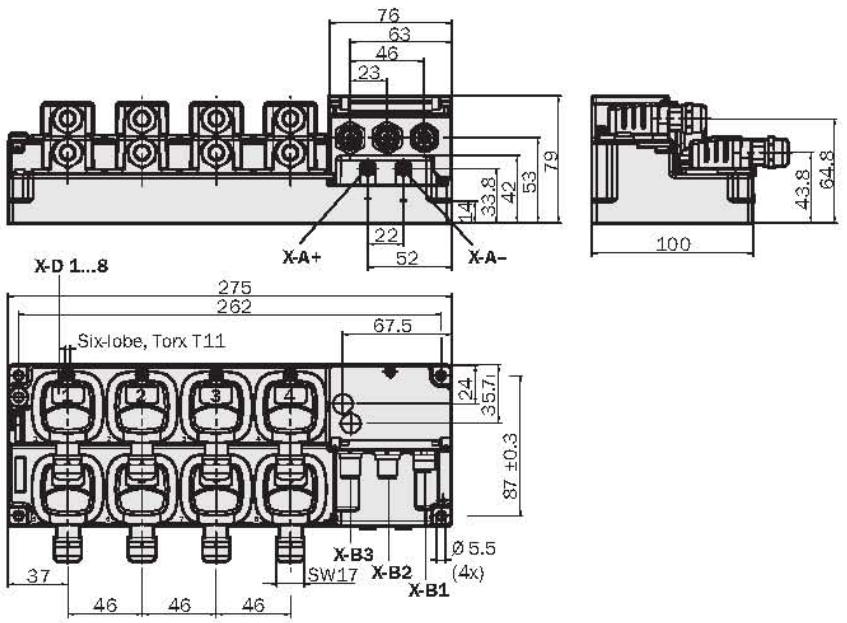
CE

Accessories

Connection systems

User software

Dimensional drawing HIPERDRIVE®-HUB HH7X



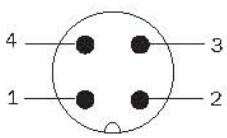
General tolerances to DIN ISO 2768-mk

PIN and wire allocation X-D1 ... 8

PIN	colour of wires	Signal
1	white	Data +
2	green	Data –
3	orange	+ 24 V
4	black	GND
5	red	+ 24 V
6	blue	GND

PIN assignment plug X-B1, AUX 24 VDC, M12, 4-pin.

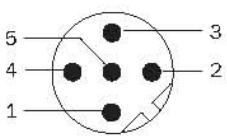
4-pin-A-coded



PIN	colour of wires	Signal
1		UB (24 V)
2		–
3		GND (0 V)
4		–

PIN assignment plug X-B2, Bus IN, M12, 5-pin.

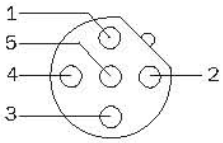
5-pin-B-coded



PIN	colour of wires	Signal
1		–
2		Sig-A (gn)
3		–
4		Sig-B (rt)
5		Screen

PIN assignment socket X-B3, Bus OUT, M12, 5-pin.

5-pin-B-coded



PIN	colour of wires	Signal
1		2P5 (+ 5V)
2		Sig-A (gn)
3		2M (0 V)
4		Sig-B (rt)
5		Screen

Technical Data	HIPERDRIVE®-HUB HH7X	Profibus-DP
Weight	4.5 kg	
Housing	Die-cast zinc	
Working temperature range	0° ... + 70°	
Storage temperature range	– 25 ... + 75 °C	
Permissible relative humidity [1]	90 %	
EMC [2]		
Resistance		
to shocks [3]	50/8 g/ms	
to vibration [4]	10/10 ... 500 g/Hz	
Protection to IEC 60529	IP 20	
Operating voltage drives	24 V + 15/– 10 % VDC, 40 A	
Connection operating voltage		
motors X-A+, X-A–, equipotential bonding	Cable lug M6	
Connection motors,	6 x screw terminal,	
operating voltage, data X-D1 ... 8	Max. core cross-section 1.5 mm^2	
Overcurrent protection motor cables	Flat fuse 10 A, not reversible	
Voltage supply Bus Interface		
and Control module	10 V ... 30 VDC	
Current consumption Bus Interface		
and Control module	300 mA max.	
Connection voltage supply		
Bus Interface and Control module X-B1	M12, 4-pin type A	
Field bus interface	Profibus DP slave V0 [5]	
Baud rates	9.6; 19.2; 45.45; 93.75; 187.5; 500;	
	1500; 3000; 6000; 12000 kBd	
Address range adjustable via switch	0 ... 125	
Bus termination resistance	Via external termination resistance	
Bus connection	M12, 5-pin type B	
Status information		
Profibus conditions LED	bicolour red-green	
Diagnostics LED	bicolour red-green	
Communication status drives LED	bicolour red-green	

[1] Condensation not permitted

[2] To EN 61000-6-2 and EN 61000-6-4

[3] To EN 60068-2-27

[4] To EN 60068-2-6

[5] To IEC 61158 type 3

Further documents (assembly and operating instructions, GSD file) can be downloaded from www.sick-stegmann.de

Order information

HIPERDRIVE®-HUB for Profibus DP

Type	Part no.	Description
ADM-HH7XPK8SXX	2040783	HIPERDRIVE®-HUB Profibus, 8 outputs, fused
DOL-HH06W2M5A	2040898	Cable for HIPERDRIVE®-HUB drive, cable length 2.5 m
DOL-HH06W05MA	2040899	Cable for HIPERDRIVE®-HUB drive, cable length 5 m
DOL-HH06W10MA	2040900	Cable for HIPERDRIVE®-HUB drive, cable length 10 m
DOL-HH06W15MA	2040979	Cable for HIPERDRIVE®-HUB drive, cable length 15 m

Order information

Profibus DP

Connection systems

Cable 7-core, per meter, 3 x 2.5 mm² + 2 x 2 x 0.34 mm², can be dragged, cable diameter 11 mm, for power supply

Type	Part no.	Cores
LTG-2907-MW	6029717	7

Profibus cable 2-core, per meter, 2 x 0.22 mm², screened, cable diameter 7.8 mm

Type	Part no.	Cores
LTG-2102-MW	6021355	2

DeviceNet

Connection systems

Cable 7-core, per meter, 3 x 2.5 mm² + 2 x 2 x 0.34 mm², can be dragged, cable diameter 11 mm, for power supply

Type	Part no.	Cores
LTG-2907-MW	6029717	7

DeviceNet cable 4-core, per meter, 1 x 2 x 0,34 mm² + 1 x 2 x 0,25 mm², cable diameter 6.8 mm

Type	Part no.	Cores
LTG-2804-MW	6028328	4

HIPERDRIVE®-HUB for Profibus

Connection systems

Round plug connector M12 loose for plug connector X-B1 AUX 24 VDC

Type	Part no.	Description	Contacts	Knurled nut	Cable-Ø (mm)
DOS-1204-G	6007302	Box straight	4	CuZn	3 ... 6.5

Round plug connector M12 connecting cable, PVC for plug connector X-B1 AUX 24 VDC

Type	Part no.	Description	Contacts	Cable length (m)
DOL-1204-G02M	6009382	Box straight	4	2
DOL-1204-G05M	6009866	Box straight	4	5
DOL-1204-G10M	6010543	Box straight	4	10
DOL-1204-G15M	6010753	Box straight	4	15

Profibus plug connector, M12 (B-coded), straight

Type	Part no.	Description	Contacts	Description	Cable	Cable length (m)
PR-DOS-1205-G	6021353	Box	5	360° screen on knurled nut	4 ... 8 mm	confectionable
PR-STE-1205-G	6021354	Connector	5	360° screen on knurled nut	4 ... 8 mm	confectionable
DOL-12PR-G05M	6026006	Box	5	360° screen on knurled nut	PUR-purple (Profibus)	5
DOL-12PR-G10M	6026008	Box	5	360° screen on knurled nut	PUR-purple (Profibus)	10
STL-12PR-G05M	6026005	Connector	5	360° screen on knurled nut	PUR-purple (Profibus)	5
STL-12PR-G10M	6026007	Connector	5	360° screen on knurled nut	PUR-purple (Profibus)	10
PRE-STE-END	6021156	Connector	5	Profibus termination resistance		

Profibus cable, 2-core, per meter, 2 x 0.22 mm², screened, cable diameter 7.8 mm

Type	Part no.	Cores
LTG-2102-MW	6021355	2

Fuses

Type	Part no.	Description
SIK-HH10A32V1N	2041034	Fuse kit HD-HUB 10 A, 32 VDC, cannot be reset

Plug housing

Type	Part no.	Description
-	2042066	Plug housing for HIPERDRIVE®-HUB with cable gland and flat seal, spare part kit