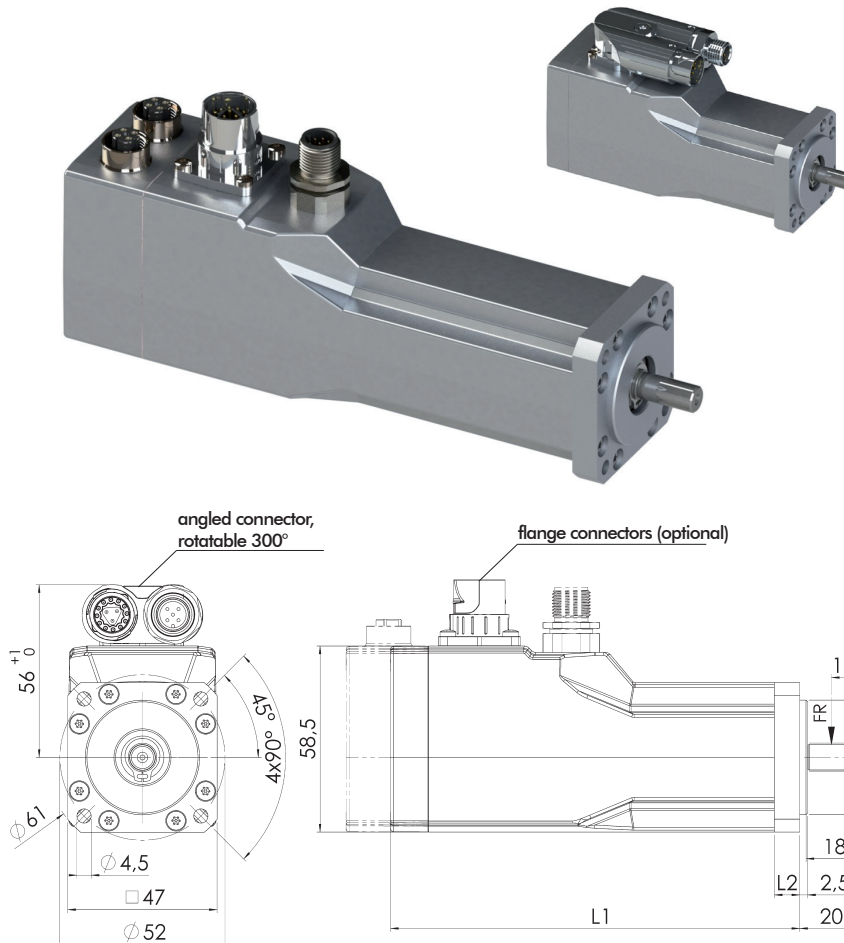


HFI 22

Integrated Synchronous Servo Drive

positioning capability
various field bus systems
functional safety STO
up to 120 Watts rated output power
with or without parking brake



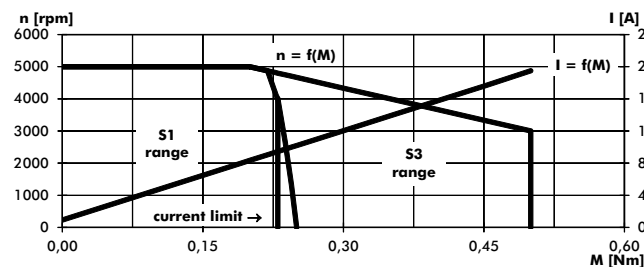
| Motor type | Dimension | |
|-----------------|-----------|----|
| | L1 | L2 |
| HFI2230-XX00 | 129 | 8 |
| HFI2230-XX00-HB | 161 | 10 |
| HFI2260-XX00 | 159 | 8 |
| HFI2260-XX00-HB | 191 | 10 |

(With optional fieldbus module the dimension L1 will be 14mm longer.)

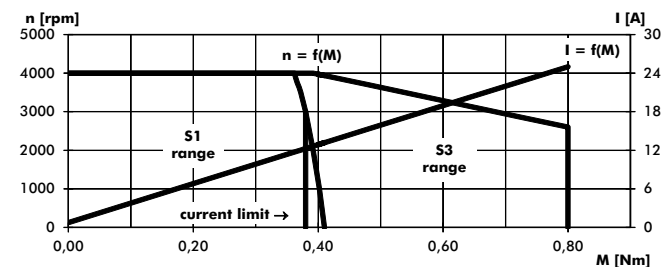
Operation characteristics:

Measured at 24VDC

HFI 2230, 24V, 4000/5000rpm



HFI 2260, 24V, 3000/4000rpm



Description:

Synchronous Servo Drives with powerful concentrated winding motor systems and integrated electronics for operation at selective 24VDC or 48VDC.

These very compact and powerful drives are well suited for peripheral application in single or multi axes systems.

The HFIs are operated either by analogue/digital signals or via the CANopen interface. By means of an optional fieldbus module, the devices can be integrated into common, Ethernet-based fieldbuses.

The fieldbus interfaces provides profile torque mode, profile velocity mode and profile position mode as well with either linear or jerk free velocity ramps.

The profile position mode supports absolute and relative target-settings. Homing is done onto limit switches, mechanical stop or at the current position.

The rotor position is evaluated through a linear magnetic angle sensor system. The sinusoidal motor current leads to smooth and constant torque development.

Optionally the drives are available with functional safety „STO“ according to Performance-Level [e], cat. 3; SIL-3.

The electrical connection is done through a compact single or dual rotary connector depending on the drive version; with optional fieldbus module and/or STO via radially arranged flange connectors.

The drive's configuration is done via RS232 and a clear and easy to use PC-Software „DSerV“ (included).

Features:

- Peripheral operation, less effort to install
- Stand alone operation with analogue speed setpoint
- Compact and powerful
- Positioning capability
- Protection class IP54 (IP65 as an option)

Options:

- Several fieldbuses: CANopen, EtherCAT, PROFINET, EtherNet/IP
- Functional safety STO (Safe Torque Off)
- 1-/2-stage planetary gear
- Parking brake
- Customer-specific solutions

edition 06.19

HFI 22

| | | HFI 2230 | HFI 2260 | |
|--|--------------------------------------|---|-------------------------|--|
| type | | - | - | |
| series | | - | - | |
| max. speed | rpm | 5000 | 4000 | |
| bus voltage | VDC | 24 / 48 | 24 / 48 | ± 20% |
| nominal speed | rpm | 4000 | 3000 | |
| nominal current ²⁾ | ADC | 6,1 / 3,0 | 7,1 / 3,6 | |
| nominal power ^{2)*)} | W | 95 | 120 | |
| operation acc. to VDE 0530 | | S1 | | |
| protection acc. to VDE 0530 | | IP 54 | | |
| rotating direction | | reversible | | |
| structural shape acc. to VDE 0530 | | IM B5 - with alignment by end plate | | |
| kind of connection | | connectors (see below) | | |
| mechanical data: | | | | |
| moment of inertia motor | kgm ² | 0,005*10 ⁻³ | 0,009*10 ⁻³ | |
| nominal torque ^{2)*)} | Nm | 0,23 | 0,38 | |
| peak torque ^{*)} | Nm | 0,5 | 0,8 | |
| speed regulation constant | N ⁻¹ cm ⁻¹ rpm | 35 | 17 | |
| mechanical time constant | ms | 2,2 | 1,8 | |
| friction torque | Nm | 0,025 | 0,025 | |
| rotor weight | kg | 0,13 | 0,21 | |
| total weight | kg | 0,85 | 1,15 | |
| ball bearings | A/B-side | 609/698 | 609/698 | |
| F _R (allowable radial shaft load) ³⁾ | N | 50 | 50 | |
| F _A (allowable axial shaft load) | N | 20 | 20 | |
| electrical data: | | | | |
| number of phases | | 3 | 3 | |
| number of poles | | 6 | 6 | |
| terminal resistance ⁴⁾ | Ω | 0,31 / 1,2 | 0,22 / 0,83 | |
| inductance ⁴⁾ | mH | 0,19 / 0,76 | 0,16 / 0,61 | |
| voltage constant ^{1)*)} | V/1000 rpm | 3,3 / 6,6 | 4,0 / 8,0 | |
| torque constant ^{1)*)} | Nm/A | 0,027 / 0,054 | 0,033 / 0,066 | |
| electrical time constant | ms | 0,6 | 0,7 | |
| thermal data: | | | | |
| ambient temperature range | °C | 0 ... 40 | 0 ... 40 | |
| isolation acc. to VDE 0530 | | F | F | |
| thermal time constant | min | 10 | 15 | |
| temperature-rise n.v. | K/W | 1,1 | 1,0 | |
| parking brake: | | | | |
| static brake torque | Nm | 1 | 1 | automatically activated |
| power | W | 10 | 10 | |
| mass moment of inertia | kgm ² | 0,0021*10 ⁻³ | 0,0021*10 ⁻³ | |
| motor weight incl. parking brake | kg | 1 | 1,3 | |
| signal interfaces: | | | | |
| analogue input ⁵⁾ | AE1 | ± 10V, 12Bit, Ri=22kOhm | | setpoint setting |
| digital inputs ⁵⁾ | DE1 ... DE8 | 0,0V ≤ U _{off} ≤ 5,0V 15,0V ≤ U _{on} ≤ 30V | | DE1 = enable DE2 ... 8 = function partly configurable |
| digital outputs ⁵⁾ | DA1 DA2 | 24V, 50mA, o.C. | | function configurable e.g. ready, speed indication... |
| serial interfaces | RS232 | max. 115200Baud | | for „DSerV“ software communication |
| | (optionally) CANopen | max. 1Mbit/s, ISO11898 | | |
| | (optionally) field bus | EtherCAT, PROFINET, EtherNet/IP | | Ethernet-based |
| | (optionally) safety | Safe Torque Off (STO) | | acc. to Performance-Level [e], cat. 3; SIL-3 |
| connectors: | | | | |
| angled connector, rotatable 300° | | Serie 915 itec (INTERCONTEC) | | power + I/O + RS232 |
| angled connector, rotatable 300° | (optionally) | Serie 615/915 ytec (INTERCONTEC) | | power + I/O + RS232 + CANopen |
| flange connector | Motor (optionally) | series 915 connector, 15-pol. (INTERCONTEC) | | power + I/O + RS232 |
| | field bus (optionally) | 2 x M12 socket, 4-pole, D coded | | fieldbus 1 + fieldbus 2 |
| | safety (optionally) | M12 plug, 8-pole, A coded | | STO |

*) Tolerance -10 %

¹⁾ Sinusoidal-peak

²⁾ Values are valid for a drive mounted to an aluminium panel (heat sink) of at least 0,15 m² at a thickness of 10 mm. For versions with gearbox, with integrated parking brake or with radial shaft seal the values are reduced.

³⁾ Center of the shaft-extension.

⁴⁾ Measured between two phases.

⁵⁾ Selective functions: AE1 ↔ DE6, DA1 ↔ DE5, DA2 ↔ DE4.

order code:

HFI22XX-XXXX-XX-...-XX

HB = parking brake, GP = planetary gear,
CO = CANopen, EC = EtherCAT
PN = PROFINET, EI = EtherNet/IP

00 = standard version
XX = customized version

2 = 24VDC operation voltage
4 = 48VDC operation voltage

S = functional safety STO
N = non safety

30 = HFI 2230
60 = HFI 2260

Accessories (optional):

- supply / signals cable assembled 2m / 5m
- CAN cable assembled 6m
- fieldbus cable assembled 5m
- STO cable assembled 5m

HFI 22

hybrid connector for power + I/O + RS232

signals: power supply 24/48VDC
digital/analogue inputs/outputs
serial interface RS232

connector: hybrid plug series 915
15-pole (12+3) (INTERCONTEC)

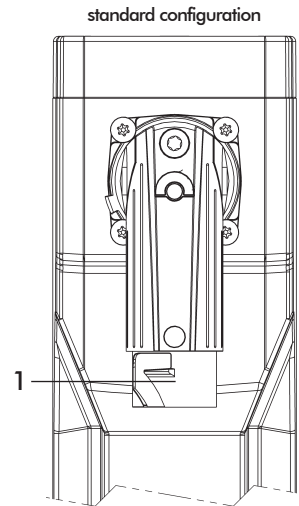
connector 15-pole
series 915



connecting side
of connector

pin assignment

- A - +Ub
- B - 0V
- C - +Ubl
- 1 - DE1
- 2 - DE2
- 3 - DE3
- 4 - DA1/DE5
- 5 - DA2/DE4
- 6 - AE1+
- 7 - AE1-/DE6
- 8 - GND
- 9 - DE7
- 10 - TxD
- 11 - RxD
- 12 - DE8



field bus options

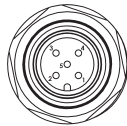
CANopen®:

profiles: CiA 301
CiA 402 drive profile

interface: galvanically isolated

connector: M12 plug 5-pole, A coded

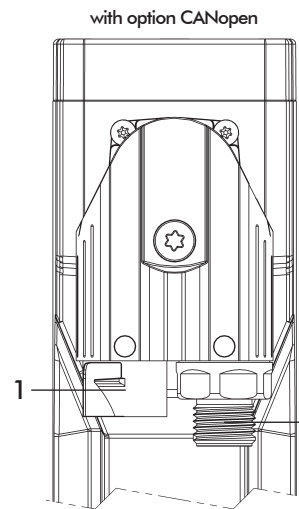
M12 plug
5-pole, A coded



connecting side
of connector

pin assignment

- 1 - CAN_SHLD
- 2 - free
- 3 - CAN_GND
- 4 - CAN_H
- 5 - CAN_L



EtherCAT (fieldbus module):

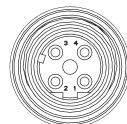
profiles: CANopen over EtherCAT (CoE)
CiA 402 drive profile

status indicators: 2 x LEDs
Module Status, Network Status

features: Integrated 2-Port-Switch

connector: 2 x M12 socket 4-pole, D coded

M12 socket
4-pole, D coded



connecting side
of connector

pin assignment

- 1 - TX+
- 2 - RX+
- 3 - TX-
- 4 - RX-

recommended cable type Cat.5e (min.)

PROFINET (fieldbus module):

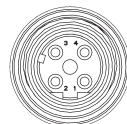
profiles: PROFINET Conformance
Class A, B and C
PROFIDRIVE

status indicators: 2 x LEDs
Module Status, Network Status

features: Integrated PROFINET IRT Switch

connector: 2 x M12 socket 4-pole, D coded

M12 socket
4-pole, D coded



connecting side
of connector

pin assignment

- 1 - TX+
- 2 - RX+
- 3 - TX-
- 4 - RX-

recommended cable type Cat.5e (min.)

EtherNet/IP (fieldbus module):

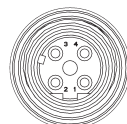
profile: Generic (CIP)

status indicators: 2 x LEDs
Module Status, Network Status

features: Integrated 2-Port-Switch

connector: 2 x M12 socket 4-pole, D coded

M12 socket
4-pole, D coded



connecting side
of connector

pin assignment

- 1 - TX+
- 2 - RX+
- 3 - TX-
- 4 - RX-

recommended cable type Cat.5e (min.)

option Safe Torque Off (STO)

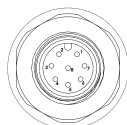
planned certifications:

- SIL-3 acc. to EN 61508, IEC 61800-5-2, EN 62061
- Performance-Level [e], Category 3 acc. to EN ISO 13849-1 / -2

supply: 20,4 ... 28,8 VDC / max. 30 mA

connector: M12 plug 8-pole, A coded

M12 plug
8-pole, A coded

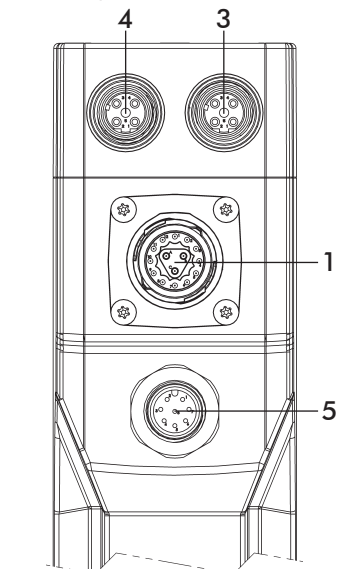


connecting side
of connector

pin assignment

- 1 - Status+
- 2 - Status-
- 3 - STO1-
- 4 - STO1+
- 5 - free
- 6 - STO2+
- 7 - STO2-
- 8 - free

with option fieldbus and/or STO



connectors:

- 1 power + I/O + RS232
- 2 CANopen
- 3 fieldbus 1 (in)
- 4 fieldbus 2 (out)
- 5 STO