ENG

BDI50

COMPACT V/f & SENSORLESS INVERTER

COD. 82271G

GEFRAN

BEYOND TECHNOLOGY

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Over fifty years of experience, an organisation highly focused on the customer's needs and constant technological innovation make Gefran a benchmark in the design and production of sensors and components for industrial process automation and control.

Expertise, flexibility and process quality are the factors that distinguish Gefran in the production of integrated tools and systems for specific applications in various industrial fields, with consolidated know-how in the plastics, mobile hydraulics, heating and lift sectors.

Technology, innovation and versatility represent the catalogue's added value in addition to the ability to create specific application solutions in association with the world's leading machine manufacturers.

APPLICATIONS

CONVEYOR AND TRASPORTATION MACHINERY

FOOD PROCESSING

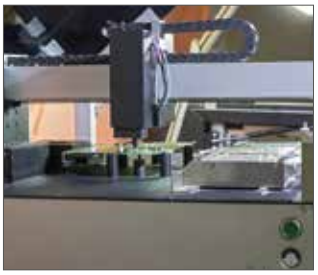
MACHINE TOOL/METAL PROCESSING MACHINERY

WOOD WORKING MACHINERY

FAN AND PUMP

PAPER/TEXTILE MACHINE

PACKAGE MACHINE



PCB AUTOMATION

AUTOMATIC DOOR CONTROL

In addition to foreseeing the market's application needs, Gefran forms partnerships with its customers to find **the best way to optimise and boost the performance of various applications**.
Gefran products communicate with one another to provide integrated solutions, and can dialogue with devices by other companies thanks to compatibility with numerous fieldbuses.

Modbus PROFIBUS CANopen DeviceNet BACnet

DESCRIPTION

The Inverter BDI50 concentrates all the characteristics required by modern industrial processes in a single compact product. At the same time BDI50 series comply with the typical needs of installers and system integrators who require forefront, practical solutions that are, above all, advantageous in terms of space, cost and simplicity of use.

The BDI50 is simple and powerful and provide maximum flexibility in machine integration through standard and optional fieldbus compatibility. User friendly interface and easy operation make BDI50 the right solution for every user and for multi-purpose applications.

> Sensorless and V/f motor control
> Compact size and user friendly standard interface
> High flexibility in machine integration
> Conformity to global standards.

POWER RANGE

	Power							
kW (Hp)	0.4 (0.5)	0.75 (1.0)	1.5 (2.0)	2.2 (3.0)	3.7 (5.0)	5.5 (7.5)	7.5 (10)	11 (15)
230 Vac, 1ph	Size 1		Size 2					
230 Vac, 3ph				Size 2			Size 4	
400 Vac, 3ph		Size 2			Size 3		Size 4	

DRIVE TYPE DESIGNATION

BDI50 -X XXX -K X X -X -Y -Y

EMI Filter:	F = included; [Empty] = not included
PNP / NPN:	N = NPN input; P = PNP input; NP = PNP and NPN
Rated voltage:	2M = 230 Vac (200...240 Vac), 1ph; 2T = 230 Vac (200...240 Vac), 3ph; 4 = 400 Vac (380...480 Vac), 3ph
Software:	X = standard
Braking unit:	B = included; X = not included
Keypad:	K = Integrated (LED keypad with 5-digits 7-segment display)
Drive power, in kW	
Mechanical drive sizes	
BDI50 drive series	

WEIGHTS AND DIMENSIONS

Mechanical size	Dimensions: Width x Height x Depth		Weight	
	mm	inches	kg	lbs
1	72.0 x 141.0 x 141.0	2.83 x 5.55 x 5.55	0.9 (1.0*)	1.98 (2.2*)
2	118.0 x 144.0 x 150.0	4.64 x 5.67 x 5.90	1.4 (1.5*)	3.08 (3.3*)
3	129.0 x 197.5 x 148.0	5.08 x 77.75 x 8.83	2.2 (2.4*)	4.85 (5.29*)
4	187.0 x 273.0 x 190.0	7.36 x 10.75 x 7.48	6.3 (6.3*)	13.89 (13.89*)

* with filter

GENERAL CHARACTERISTICS

Control Mode		V/f Control, Sensorless control (SLV)
Speed control accuracy		1% (SLV) 3% (V/f open-loop)
Overload		150% rated current for 60sec
Frequency	Output freq. Range	0.01~599.00Hz
	Setting	Keypad : Set directly with ▼▲ keys or the VR (Potentiometer integrated)
		External signal: · AVI (0~10V / 2~10V), ACI (0~20mA, 4~20mA) input · multifunction digital inputs · by communication
	Frequency limit	Lower and upper frequency limits
		3 -skip frequency settings
Run & Stop	Methods	· Keypad · Multifunction terminals (2/3 wire selection) · Jog function · By communication
Main Controls	V/f curve setting	6 fixed + one customized
	Carrier frequency	1~16kHz (default 5kHz)
	Acceleration and deceleration control	2 sets Acc / dec time parameters 4 points S curve parameters
	Multifunction digital input	5, 19 functions Sizes 1/2: NPN&PNP by separate models Sizes 3/4: NPN&PNP selection from terminals
	Multifunction digital output	1 relay, 16 functions
	Multifunction analog input	2, AVI: 0~10V/2~10V, ACI: 0~20mA/4~20mA
	Multifunction analog output	1 (0~10V), 5 functions
	Main features	Autotune, Torque compensation, Slip compensation, 8 preset speeds, Auto-run, PID control, torque boost, V/f starting Frequency, Fault reset, Powerloss ride through, DC-brake, Mechanical brake control, AVR function, Fan control
Display	Info available	Parameter, parameter value, frequency, line speed, DC voltage, output voltage, output current, PID feedback, input and output terminal status, Heat sink temperature, Program Version, Fault Log
	LED Status Indicator	Run, stop, forward and reverse
Protection Functions	Motor over-temperature	By PTC (AVI)
	Overvoltage	230V Class : > 410V, 400V Class: > 820V
	Undervoltage	230V Class: < 190V, 400V Class: < 380V
	Auto-Restart	Inverter auto-restart after a momentary power loss
	Stall Prevention	Stall prevention for Acceleration / Deceleration and continuous Run
	Additional protective functions	Heatsink over temperature protection, Auto carrier frequency reduction with temperature rise, Protection of reverse operation, Auto restart attempts setting, Parameter lock, Over voltage suppression function
Environment Specification	Protection degree	IP20
	Operating Temperature	-10~ +40°C (size 1), -10~+50°C (all other sizes)
	Storage Temperature	-20~+60°C
	Humidity	Under 95% RH (no condensation)
	Altitude	Max 3000 m. (up to 1000 m without derating)
	Vibration	2G (19.6m/s²) for 57~150Hz and below. 0.3mm for 10~57Hz (According to IEC60068-2-6 standard)
Communication Function		Built in: RS-485 with Modbus RTU / ASCII (standard RJ45 connection), BACnet Optionals: Profibus, DeviceNet, CANopen, TCP/IP
Braking unit		Built-in on 3ph 400V Class and 3ph 230V Class 7.5kW
EMI filter		Built-in on –F version 1ph 230V Class and 3ph 400V Class
Certification	CE RoHS	In compliance with EN61800-3 (CE & RE) and EN61800-5-1(LVD) Conformity to RoHS directive
	c UL us	UL508C

GENERAL CHARACTERISTICS

INTEGRATED KEYPAD WITH POTENTIOMETER

The integrated programming keypad with 5 Digit 7 Segment LED display provide fast programming and immediate start-up. Simple speed adjustment through integrated potentiometer.

PROCESSOR

32 bit / 100MHz CPU design provides high performance, faster A/D conversion and torque compensation.

BUILT-IN EMI FILTER AND BRAKING TRANSISTOR

Integrated filter for interference suppression in compliance with EN61800-3 First environment and built-in braking transistor allow high installation flexibility and panel space reduction.

I/O CONFIGURATION

The BDI50 inverter features a standard I/O card to satisfy industrial standard applications.

- Digital inputs: 5, NPN/PNP
- Digital output: 1, relay
- Analog inputs: 2, AVI: 0~10V /2~10V, ACI: 0~20mA / 4~20mA
- Analog output: 1, 0-10V
- Motor protection input: by PTC (AVI).

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SERIAL COMMUNICATION

Modbus

The BDI50 integrates a standard RS485 serial line with Modbus RTU/ASCII protocol.

A frontal RJ45 with dust-proof socket make it very easy to access and use.

RFI-JUMPER FOR IT MAINS

Removable "y" capacitor for use on IT mains.

PTC MOTOR PROTECTION

Motor overtemperature protection function.

EARTH TERMINALS

Earthing terminals built-in into heat sink to provide effective grounding protection.

COMPACT AND ROBUST DESIGN

Coated PCB offers protection for harsh environments.

BDI50 Size 1 has fanless design with cooling heatsink for greater robustness against humidity, dust, oil mist, and vibration.

Sizes 2 to 4 with fan design to enhance the cooling ability.

FIELDBUS

The BDI50 can be easily integrated into machine architectures through integrated standard Bacnet and optional Profibus, CANopen, Devicenet and TCP-IP communication modules.

Model	Description
EXP-PDP-BDI/VDI	Profibus DP interface module
EXP-TCPIP-BDI/VDI	Ethernet TCP/IP interface module
EXP-DN-BDI/VDI	DeviceNet interface module
EXP-CAN-BDI/VDI	CanBus interface module

BACnet® PROFIBUS® CANopen DeviceNet™

COPY UNIT

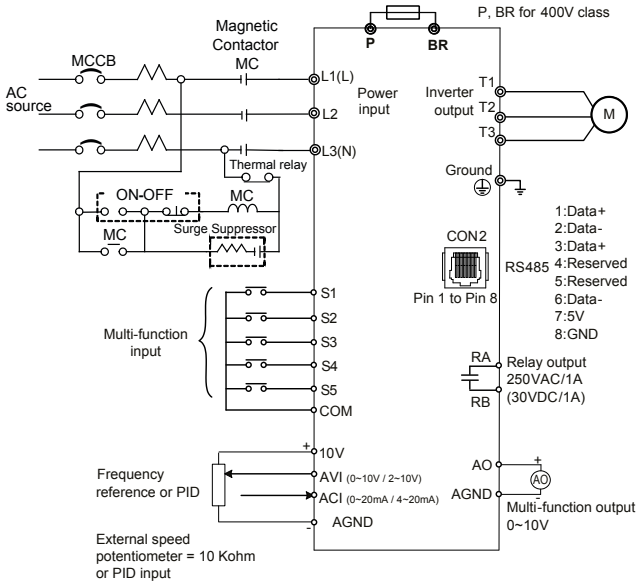
- Copying parameters settings from one AC drive to another.
- Can be used as remote keypad.
- Standard RJ45 interface cable (2mt, included).

RJ45 TO USB CONNECTING CABLE

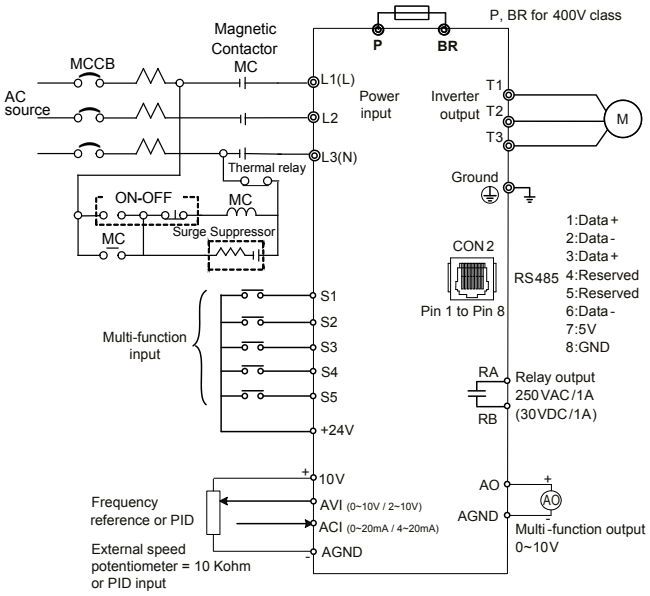
For the connection between inverter and PC using Gf_eXpress and PC Tools configurator (1.8 m. length).

WIRING DIAGRAM

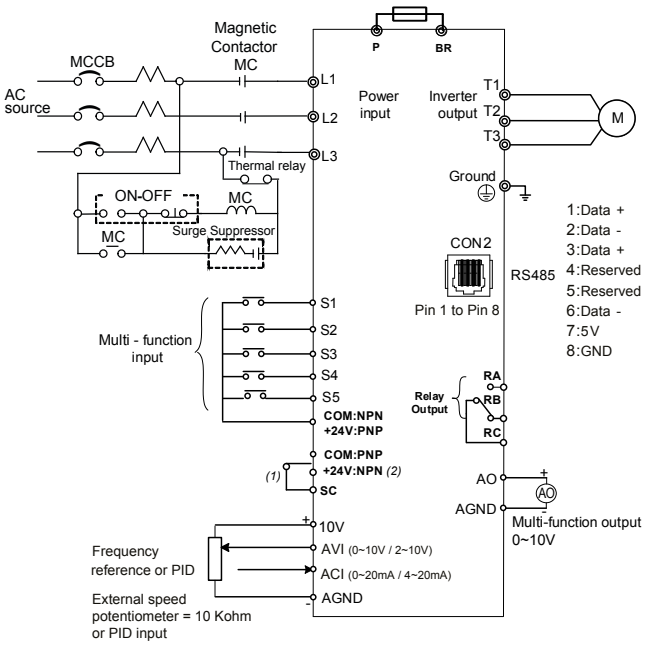
• SIZES 1 / 2, NPN INPUT



• SIZES 1 / 2, PNP INPUT



• SIZES 3 / 4



Wiring (AC Input)	Model	Power Input Terminal
NPN	200V (Single-Phase)	L1 (L) ; L3 (N)
	200V (Three-Phase)	L1(L) ; L2 ; L3 (N)
	400V (Three-Phase)	L1 ; L2 ; L3
PNP	200V (Single-Phase)	L1 (L) ; L3 (N)
	400V (Three-Phase)	L1 ; L2 ; L3

(1) NPN: 24V connected to SC.
PNP: COM connected to SC.

(2) If SC is not connected, inverter parameter group 03-XX can't be enabled.

CHOOSING THE INVERTER: INPUT AND OUTPUT DATA

SINGLE PHASE - 230V CLASS

	Sizes BDI50		1004	1007	2015	2022
Output Rating	Rated Output Capacity	kVA	1.0	1.65	2.9	4.0
	Rated Output Current	A	2.6	4.3	7.5	10.5
	Maximum Applicable Motor	HP	0.5	1	2	3
		kW	0.4	0.75	1.5	2.2
	Output Voltage	V	Three-Phase, 0 to 240V			
	Output Frequency	Hz	Based on parameter setting 0.01~599			
Input Rating	Rated Voltage, Frequency		Single-Phase, 200V to 240V, 50/60Hz			
	Allowable Voltage Fluctuation		+10% ~ -15%			
	Allowable Frequency Fluctuation		±5%			
	Input current (1)	A	7.2	11	15.5	21
Allowable momentary power loss time		s	1.0	1.0	2.0	2.0
Enclosure			IP20			

THREE PHASE - 230V CLASS

	Sizes BDI50		2022	4075
Output Rating	Rated Output Capacity	kVA	4.00	13.34
	Rated Output Current	A	10.5	35
	Maximum Applicable Motor	HP	3	10
		kW	2.2	7.5
	Output Voltage	V	Three-Phase, 0 to 240V	
	Output Frequency	Hz	Based on parameter setting 0.01~599	
Input Rating	Rated Voltage, Frequency		Three-Phase, 200V to 240V, 50/60Hz	
	Allowable Voltage Fluctuation		+10% ~ -15%	
	Allowable Frequency Fluctuation		±5%	
	Input current (1)	A	12.2	38.5
Allowable momentary power loss time		s	2.0	2.0
Enclosure			IP20	

(1) The input current is calculated value at full rated output current.

THREE PHASE - 400V CLASS

	Sizes BDI50		2007	2015	2022	3037	3055	4075	4110
Output Rating	Rated Output Capacity	kVA	1.7	2.9	4.0	7.01	9.91	13.34	18.29
	Rated Output Current	A	2.3	3.8	5.2	9.2	13.0	17.5	24
	Maximum Applicable Motor	HP	1	2	3	5	7.5	10	15
		kW	0.75	1.5	2.2	3.7	5.5	7.5	11
	Output Voltage	V	Three-Phase, 0 to 480V						
	Output Frequency	Hz	Based on parameter setting 0.01~599						
Input Rating	Rated Voltage, Frequency		Three-Phase, 380V to 480V, 50/60Hz						
	Allowable Voltage Fluctuation		+10% ~ -15%						
	Allowable Frequency Fluctuation		±5%						
	Input current [1]	A	4.2	5.6	7.3	10.1	14.3	19.3	26.4
Allowable momentary power loss time		s	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Enclosure			IP20						

[1] The input current is calculated value at full rated output current.

POWERLOSS

Sizes BDI50	Power Loss W	Heat Loss kcal/hr
230 V Class : single phase and three phase		
BDI50-1004-...-2M-...	27.0	23.2
BDI50-1007-...-2M-...	45.0	38.7
BDI50-2015-...-2M-...	64.0	55.0
BDI50-2022-...-2M/2T-...	70.0	60.2
BDI50-4075-...-2T-...	330.0	283.8
400 V Class: three phase		
BDI50-2007-...-4-...	30.0	25.8
BDI50-2015-...-4-...	37.0	31.8
BDI50-2022-...-4-...	61.0	52.5
BDI50-3037-...-4-...	98.3	84.5
BDI50-3055-...-4-...	157.0	135.0
BDI50-4075-...-4-...	234.0	201.2
BDI50-4110-...-4-...	297.0	255.4

All inverters are equipped with internal fans (excluding BDI50 size 1).

DRIVE MODELS & CODES

SINGLE PHASE - 230V CLASS

- Without EMI filter
- IP20

Code	Model	Pn @ 230 Vac	Configuration
S6N01	BDI50-1004-KXX-2M-N	0.4 kW	Without EMI filter - NPN Input
S6N02	BDI50-1007-KXX-2M-N	0.75 kW	Without EMI filter - NPN Input
S6N03	BDI50-2015-KXX-2M-N	1.5 kW	Without EMI filter - NPN Input
S6N04	BDI50-2022-KXX-2M-N	2.2 kW	Without EMI filter - NPN Input

- With integrated EMI filter
- IP20

Code	Model	Pn @ 230 Vac	Configuration
S6N05	BDI50-1004-KXX-2M-P-F	0.4 kW	With EMI filter - PNP Input
S6N06	BDI50-1007-KXX-2M-P-F	0.75 kW	With EMI filter - PNP Input
S6N07	BDI50-2015-KXX-2M-P-F	1.5 kW	With EMI filter - PNP Input
S6N08	BDI50-2022-KXX-2M-P-F	2.2 kW	With EMI filter - PNP Input

THREE PHASE - 230V CLASS

- Without EMI filter
- IP20

Code	Model	Pn @ 230 Vac	Configuration
S6N11	BDI50-2022-KXX-2T-N	2.2 kW	Without EMI filter - NPN Input
S6N14	BDI50-4075-KBX-2T-NP	7.5 kW	Internal Braking Unit - Without EMI filter - PNP/NPN Input

THREE PHASE - 400V CLASS

- Without EMI filter
- IP20

Code	Model	Pn @ 400 Vac	Configuration
S6N15	BDI50-2007-KBX-4-N	0.75 kW	Internal Braking Unit - Without EMI filter - NPN Input
S6N16	BDI50-2015-KBX-4-N	1.5 kW	Internal Braking Unit - Without EMI filter - NPN Input
S6N17	BDI50-2022-KBX-4-N	2.2 kW	Internal Braking Unit - Without EMI filter - NPN Input
S6N18	BDI50-3037-KBX-4-NP	3.7 kW	Internal Braking Unit - Without EMI filter - PNP/NPN Input
S6N19	BDI50-3055-KBX-4-NP	5.5 kW	Internal Braking Unit - Without EMI filter - PNP/NPN Input
S6N20	BDI50-4075-KBX-4-NP	7.5 kW	Internal Braking Unit - Without EMI filter - PNP/NPN Input
S6N21	BDI50-4110-KBX-4-NP	11 kW	Internal Braking Unit - Without EMI filter - PNP/NPN Input

- With integrated EMI filter
- IP20

Code	Model	Pn @ 400 Vac	Configuration
S6N22	BDI50-2007-KBX-4-P-F	0.75 kW	Internal Braking Unit - With EMI filter - PNP Input
S6N23	BDI50-2015-KBX-4-P-F	1.5 kW	Internal Braking Unit - With EMI filter - PNP Input
S6N24	BDI50-2022-KBX-4-P-F	2.2 kW	Internal Braking Unit - With EMI filter - PNP Input
S6N25	BDI50-3037-KBX-4-NP-F	3.7 kW	Internal Braking Unit - With EMI filter - PNP/NPN Input
S6N26	BDI50-3055-KBX-4-NP-F	5.5 kW	Internal Braking Unit - With EMI filter - PNP/NPN Input
S6N27	BDI50-4075-KBX-4-NP-F	7.5 kW	Internal Braking Unit - With EMI filter - PNP/NPN Input
S6N28	BDI50-4110-KBX-4-NP-F	11 kW	Internal Braking Unit - With EMI filter - PNP/NPN Input

ACCESSORIES AND OPTIONS

Code	Model	Dimension: WxHxd (mm)	Weight (kg)	Note
Input choke				
S7AB5	LR3y-2055	120 x 125 x 75	2.2	For BDI50-2022-...-2T
S7AB8	LR3y-3150	150 x 169 x 85	5.5	For BDI50-4075-...-2T
S7AAD	LR3y-1007	120 x 125 x 65	1.8	For BDI50-2007-...-4
S7AAE	LR3y-1015	120 x 125 x 65	1.8	For BDI50-2015-...-4
S7AAF	LR3y-1022	120 x 125 x 65	1.8	For BDI50-2022-...-4
S7AAG	LR3y-2040	120 x 125 x 65	2	For BDI50-3037-...-4
S7AB5	LR3y-2055	120 x 125 x 75	2.2	For BDI50-3055-...-4
S7AB6	LR3y-2075	150 x 155 x 79	4.9	For BDI50-4075-...-4
S7AB7	LR3y-3110	150 x 155 x 79	5	For BDI50-4110-...-4
Output choke				
S7FG1	LU3-001	120 x128 x 71	2.7	For BDI50-1004-...-2M
S7FG1	LU3-001	120 x128 x 71	2.7	For BDI50-1007-...-2M
S7FG2	LU3-003	180 x 170 x 110	5.2	For BDI50-2015-...-2M
S7FG3	LU3-005	180 x 170 x 110	5.8	For BDI50-2022-...-2M
S7FG3	LU3-005	180 x 170 x 110	5.8	For BDI50-2022-...-2T
S7FH2	LU3-015	180 x 160 x 170	7.5	For BDI50-4075-...-2T
S7FG1	LU3-001	120 x128 x 71	2.7	For BDI50-2007-...-4
S7FG1	LU3-001	120 x128 x 71	2.7	For BDI50-2015-...-4
S7FG1	LU3-001	120 x128 x 71	2.7	For BDI50-2022-...-4
S7FG2	LU3-003	180 x 170 x 110	5.2	For BDI50-3037-...-4
S7FG3	LU3-005	180 x 170 x 110	5.8	For BDI50-3055-...-4
S7FG4	LU3-011	180 x 180 x 130	8	For BDI50-4075-...-4
S7FG4	LU3-011	180 x 180 x 130	8	For BDI50-4110-...-4

Note: Input chokes for inverter max frequency = 400 Hz and max Switching frequency = 20 kHz.

Code	Model suggested	Dimension WxHxd (mm)	Weight (kg)	W	Ohm	ED (%)	Braking torque (%)	For BDI50-...:
Braking resistor								
S8SA28	RF 780 20R	155x27x36	0.26	780	20	10	117	4075-...-2T
S8SA25	RFH 165 720R	155x27x36	0.26	60	750	8	123	2007-...-4
S8TOCR	RF 300 DT 400R	260x38x106	1.4	150	400	10	117	2015-...-4
S8TOCP	RF 220 T 250R	300x27x36	0.5	200	250	8	123	2022-...-4
S6F64	RFH 600 160R	320x27x36	0.6	400	150	10	123	3037-...-4
S8TOCM	RFPD 900 DT 100R	260x70x106	2.2	600	100	10	123	3055-...-4
S8SZ0	RFPR 750 D 80R	245x75x100	2.7	750	80	10	117	4075-...-4
S8SA30	BRT 1K6 52R	580x140x110	4.2	1600	50	10	123	4110-...-4

Note:
Braking resistor: W= (Vpnb * Vpnb) * ED% / Rmin
1. W: The power consumption of braking action
2. Vpnb: The voltage of braking action (220V=380VDC, 440V=760VDC)
3. ED%: The effective period of braking action
4. Rmin: braking resistor minimum value (ohms)

Code	Model	Description
Communication modules		
S6N218	EXP-PDP-BDI/VDI	Profibus DP interface module
S6N219	EXP-TCPIP-BDI/VDI	Ethernet TCP/IP interface module
S6N220	EXP-DN-BDI/VDI	DeviceNet interface module
S6N221	EXP-CAN-BDI/VDI	CanBus interface module
Others		
S6N228	Memory KB-BDI/VDI	Copy unit
S6N229	Cable RJ45 to USB 1.8m	RJ45 to USB connecting cable (1.8 m. length)
S6N238	KIT DIN BDI50 Size 1	DIN rail kit Size 1
S6N239	KIT DIN BDI50 Size 2	DIN rail kit Size 2
S6N240	EMC grounding kit Size 1	Ground kit to enhance EMC capabilities
S6N241	EMC grounding kit Size 2	

SOFTWARE

GF-eXpress PROGRAMMING SOFTWARE

Applications

- Configuring parameters of Gefran devices (Instruments, Drives, Sensors)
- Tuning control parameters with on-line tests and trends
- Managing parameter archive for multiple configuration.

Features

- Guided product selection
- Multiple languages
- Creation and storage of recipes
- Oscilloscope
- Simplified settings
- Parameter printout
- Network autoscan

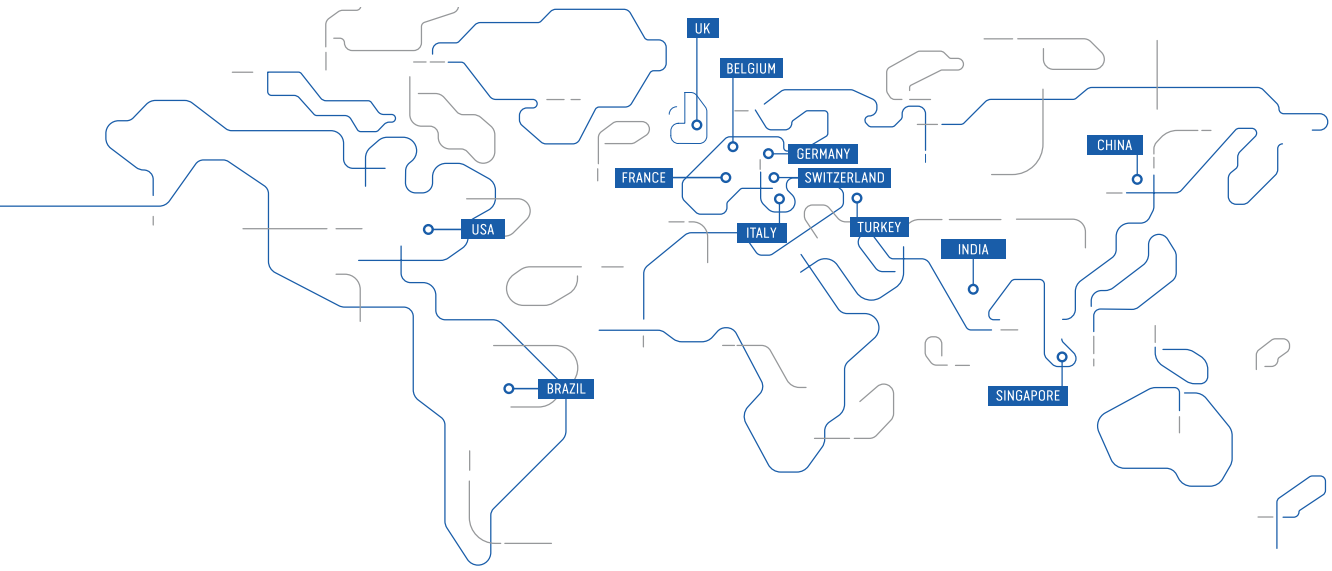
GF_eXpress software configures the parameters of the automation components, drives and sensors in the Gefran catalogue.

The graphic interface makes selecting and configuring parameters easy and intuitive. Devices are grouped according to product type and functions.

Products are searched by means of a context search and a display of product photos.

This provides a single device library for all Gefran products.

Complete configuration information for every device is given in XML format to facilitate expansion of the catalogue and parameters.



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