

### Main applications

- Keyboards to manage machine movement in the following sectors:
  - Plastics
  - Packaging
  - Wood
  - Metalworking

### Main characteristics

- 32/48/64 keys - 32/48/64 LEDs
- USB port (connected to GF\_VEDO)
- Communication protocols:
  - High-speed serial [GT-TAST]
  - Modbus/TCP
  - CANopen
  - Profibus DP
  - PS/2
- Removable key cards

### PROFILE

TF keyboards are used with the GF\_VEDO family of control terminals. The models TF32-65 TF32-104 TF48-121 TF64-150 differ for the number of keys/LEDs (32,48 or 64) and for the mechanical dimensions, in line with models GF\_VEDO65 , GF\_VEDO104, GF\_VEDO121 , GF\_VEDO150 .

The use of the keys/leds that can be fully customized by the user:

- key function
- LED function
- removable card

The front panel has a USB port from the GF\_VEDO complete with cover to ensure IP65 protection.

This guarantees easy access (import/export) of application data. Different communication protocols proposed:

- High-speed serial [GT-TAST] for "point to point" use of a single keyboard at a maximum distance of 1 meter.
- CANopen, Ethernet Modbus TCP, Profibus DP" for applications

requiring remoting and/or use of multiple keyboards. The rear panel has a series of digital inputs whose state can be displayed via software.

They can be used immediately with the TE electromechanical keyboard [see accessories].

### TECHNICAL DATA

#### KEYS

Function: Customizable  
 Number: 32 (TF32), 48 (TF48), 64 (TF64)  
 Characteristics:
 

- Dome keys
- Polyester front with thermoforming;
- Number of operations: > 2.000.000
- Key dimensions: 17,13x14,13 mm

#### LEDS

Function: Customizable  
 Number: 32 (TF32), 48 (TF48), 64 (TF64)  
 (1 1 Key - 1 LED)  
 Color: Green

### GENERAL DATA

#### Power supply <sup>(1)</sup>:

- 24VDC±25%, 10W
- pin male connector
- Protection against inversion of polarity

<sup>(1)</sup> Power supply needed only with Ethernet Modbus TCP, CANopen protocols

#### Case:

- Aluminium

#### Protection level:

- IP65 (front)
- IP20 (rear)

#### Temperature:

- working: 0...50°C
- storage: - 20°C...70°C

#### Relative humidity:

- working: < 90% non condensing
- storage: < 90% non condensing

#### Impact resistance:

- Conforms to IEC 60068-2-27

#### Vibration:

- Conforms to IEC 60068-2-6

#### Certifications:

- CE
- UL (pending)

## I/O PERIPHERALS

- Name: **USB**
- Type: USB <sup>(2)</sup>
- Connector: Type A
- Cable: 100 cm

<sup>(2)</sup> See characteristics of GF\_VEDO

- Name: **PS/2**
- Type: PS/2 AT
- Connector: RJ45 without LED
- Cable: 90 cm  
(with PS2 connector)

- Name: **ETH1 / ETH2**
- Type: Ethernet 10/100 Base-T
- Connector: RJ45 with LED
- Cable: none
- Address: double rotary-switch  
(ID1/ID2)

- Name: **CAN1 / CAN2**
- Type: CANOpen Slave,  
Optically isolated (1000V)
- Connector: D-Sub 9 pin Male
- Cable: none

- Name: **PROFIBUS DP**
- Type: Profibus DP Slave,  
Optically isolated (1000V)
- Connector: D-Sub 9 pin Female
- Cable: none

- Name: **GT-TAST**
- Type: Serial protocol  
proprietary
- Connector: RJ45 without LED
- Cable: 50 cm

## DIMENSIONS

- TF32-65**
- Mechanical. dim: 187x106 mm
- Template: 178x97x27 mm
- Weight: 0,4 Kg

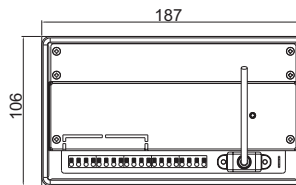
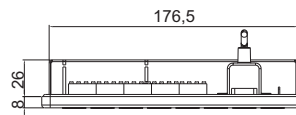
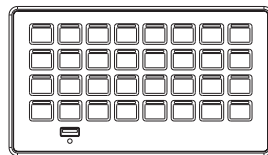
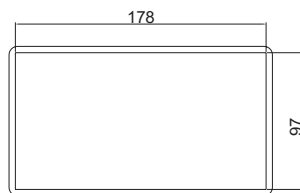
- TF32-104**
- Mechanical. dim: 266x106 mm
- Template: 257x97x27 mm
- Weight: 0,5 Kg

- TF48-121**
- Mechanical. dim: 305x106 mm
- Template: 298x101x26 mm
- Weight: 0,6 Kg

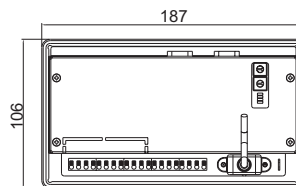
- TF48-150**
- Mechanical. dim: 369x106 mm
- Template: 362x101x26 mm
- Weight: 0,7 Kg

## DIMENSIONS

### Dimension TF32-65

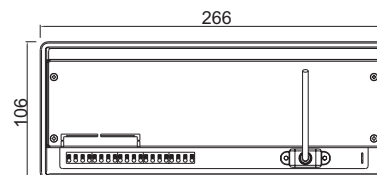
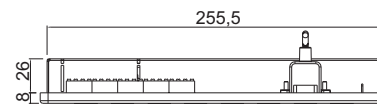
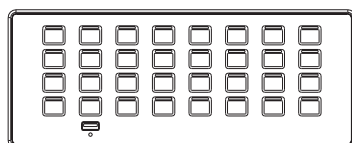
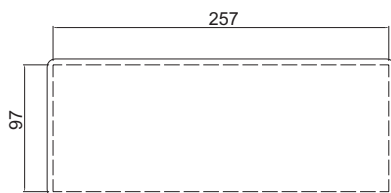


TF32-65-S0  
TF32-65-P2

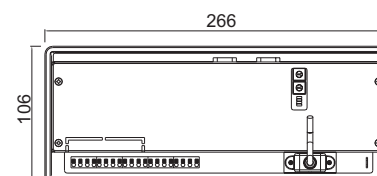


TF32-65-E0  
TF32-65-C0  
TF32-65-P0

### Dimension TF32-104



TF32-104-S0  
TF32-104-P2

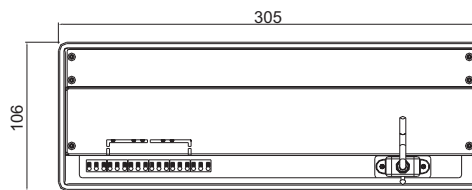
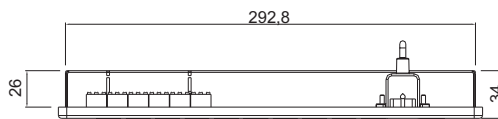
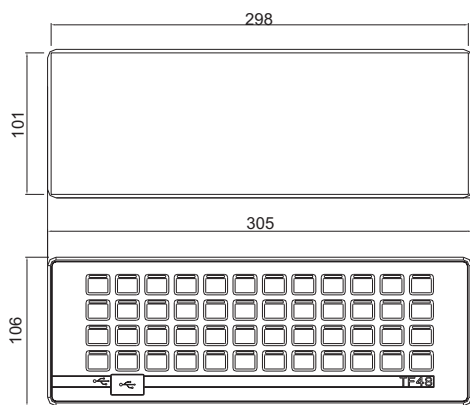


TF32-104-E0  
TF32-104-C0  
TF32-104-P0

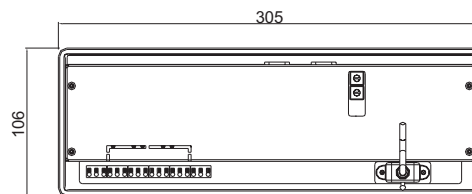
Nota: All measurements are in mm, with tolerance  $\pm 0.5$  mm

## DIMENSIONS

### Dimension TF48-121

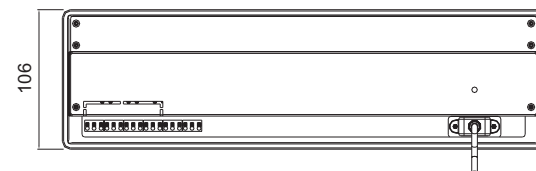
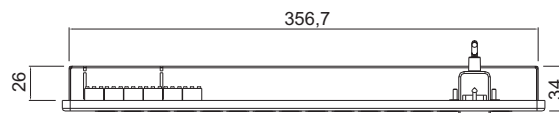
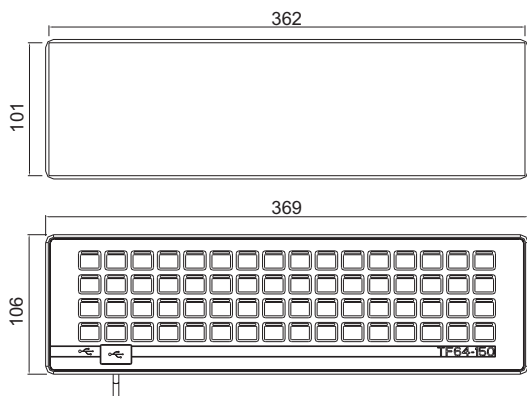


TF48-121-S0  
TF48-121-P2

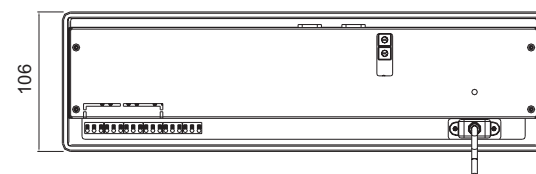


TF48-121-E0  
TF48-121-C0  
TF48-121-P0

### Dimension TF64-150



TF64-150-S  
TF64-150-P

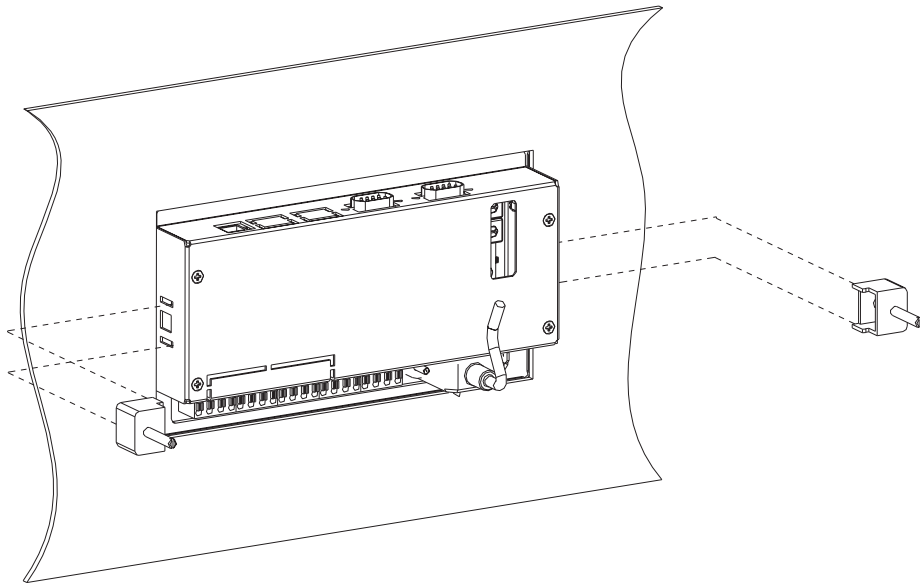


TF64-150-E  
TF64-150-C  
TF64-150-P

Nota: All measurements are in mm, with tolerance  $\pm 0.5$  mm

## MOUNTING

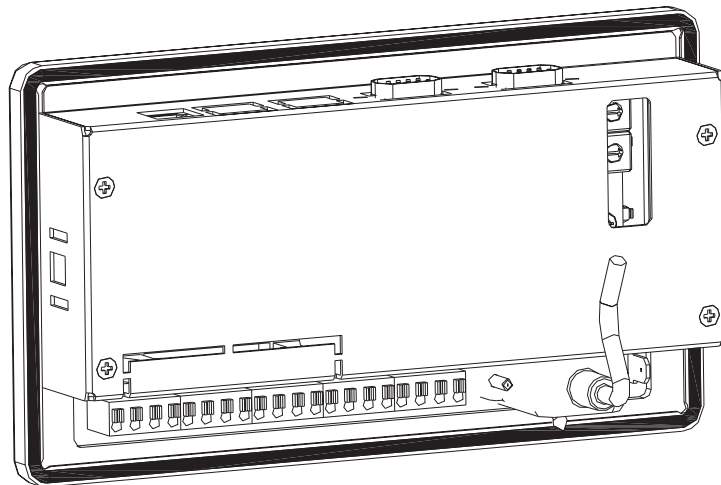
The TF keyboards are designed for front-panel attachment.  
After drilling the holes on the plate as shown on the template, attach the keyboards with the blocks supplied with the product.



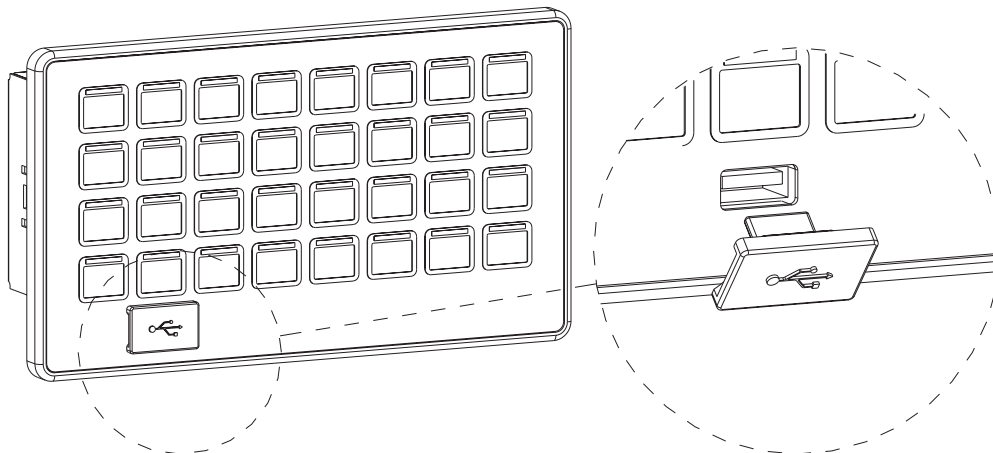
### Installation notes:

- the edges of the hole for the panel must be perfectly smooth and flat
- tighten each fastening screw until the corner of the frame touches the panel
- check that the seal is properly positioned

### Seal



### Cover USB



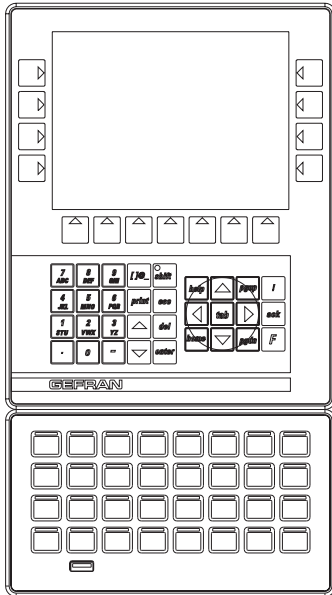
## INSTALLATION

### TF32-65 (GF\_VEDO 65 terminals)

When installing a TF32-65 keyboard with fieldbus protocols under a GF\_VEDO 65CT terminal, maintain minimum distance “d” of 80 mm.

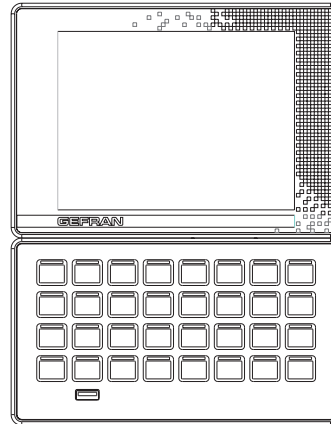
The other combinations of TF32-65 keyboards with GF\_VEDO 65CT terminals permit flush mounting.

GF\_VEDO 65CK



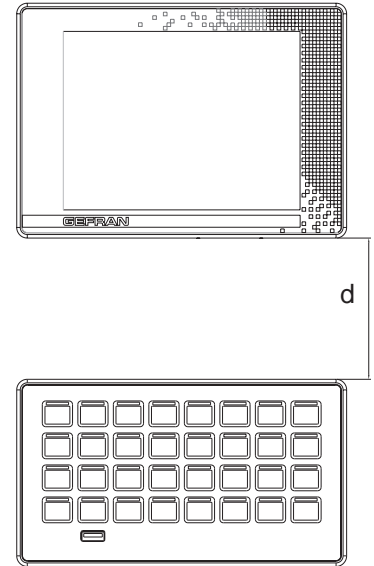
TF 32-65

GF\_VEDO 65CT



TF 32-65-S0  
TF 32-65-P2

GF\_VEDO 65CT



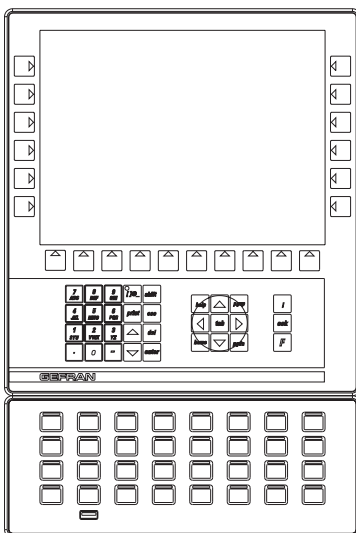
TF 32-65-E0  
TF 32-65-C0  
TF 32-65-P0

### TF32-104 (GF\_VEDO 104 terminals)

When installing a TF32-104 keyboard with fieldbus protocols under a GF\_VEDO 104CT terminal, maintain minimum distance “d” of 50 mm.

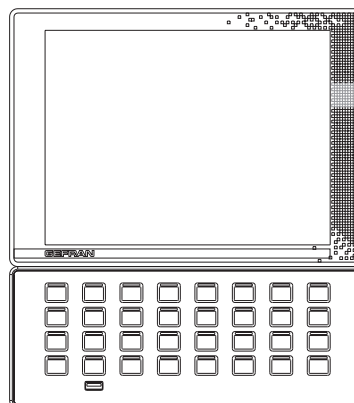
The other combinations of TF32-104 keyboards with GF\_VEDO 104 terminals permit flush mounting.

GF\_VEDO 104CK



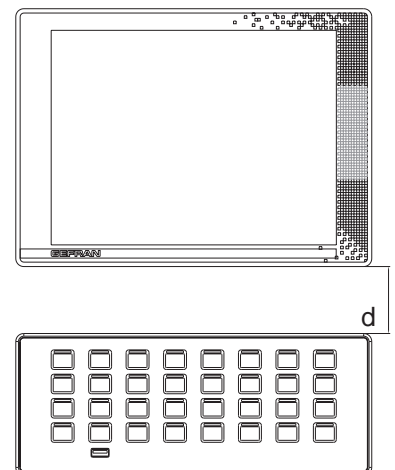
TF 32-104

GF\_VEDO 104CT



TF 32-104-S0  
TF 32-104-P2

GF\_VEDO 104CT



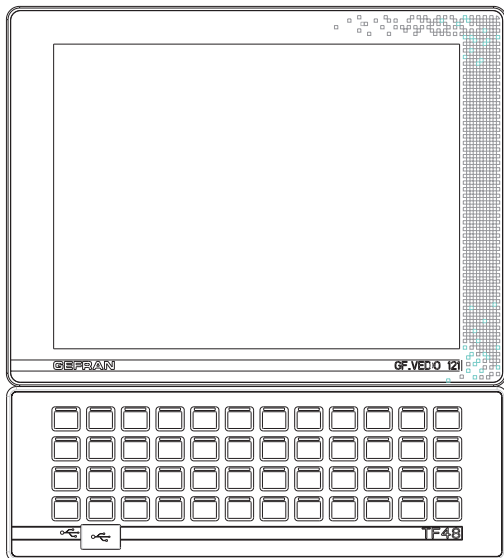
TF 32-104-E0  
TF 32-104-C0  
TF 32-104-P0

### TF48-121 (GF\_VEDO 121 terminals)

When installing a TF48-121 keyboard with fieldbus protocols under a GF\_VEDO 121CT terminal, maintain minimum distance "d" of 50 mm.

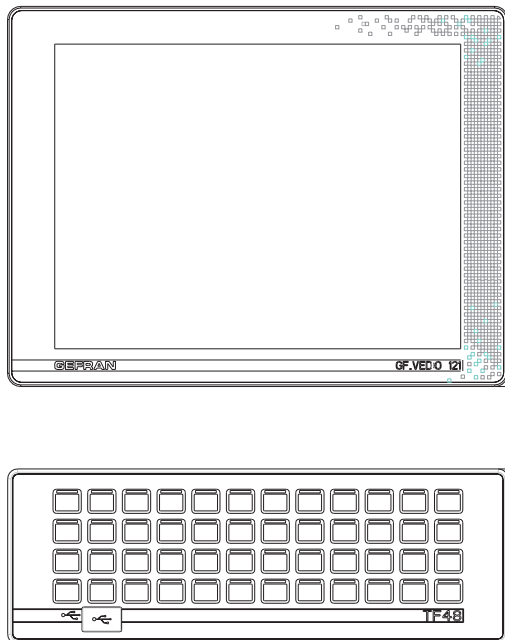
The other combinations of TF48-121 keyboards with GF\_VEDO 121 terminals permit flush mounting.

GF\_VEDO 121CT



TF 48-121-S0  
TF48-121-P2

GF\_VEDO 121CT



TF 48-121-C0  
TF48-121-E0  
TF48-121-P0

d

### TF64-150 (GF\_VEDO 150 terminals)

When installing a TF64-150 keyboard with fieldbus protocols under a GF\_VEDO 150CT terminal, maintain minimum distance "d" of 50 mm.

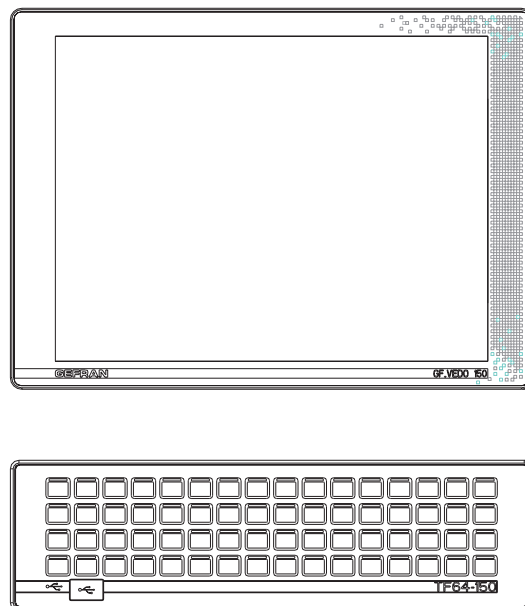
The other combinations of TF64-150 keyboards with GF\_VEDO 150 terminals permit flush mounting.

GF\_VEDO 150CT



TF 64-150-S0  
TF 64-150-P2

GF\_VEDO 150CT



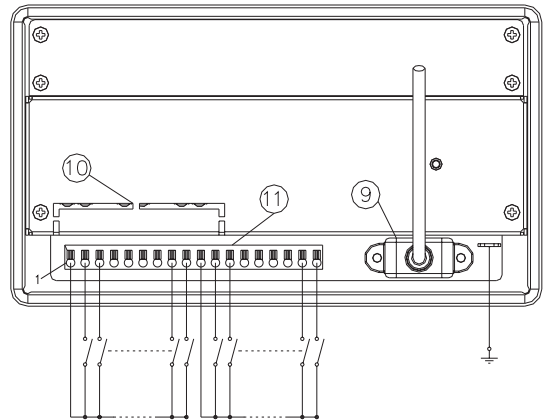
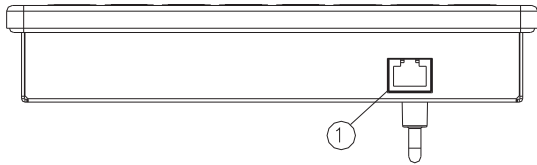
TF 64-150-C0  
TF 64-150-E0  
TF 64-150-P0

d

## CONNECTIONS

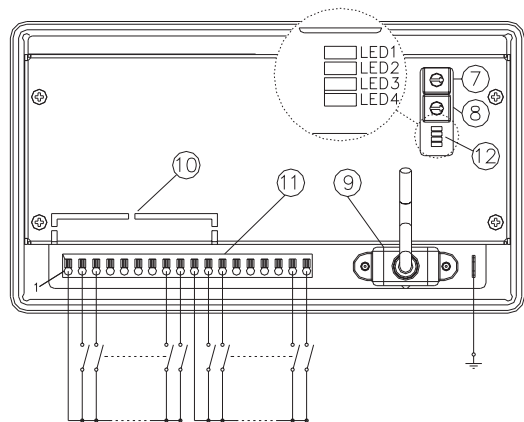
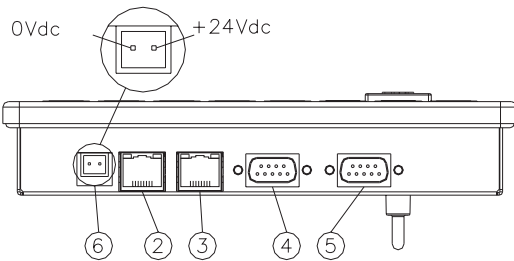
TF32-65/TF32-104/TF48-121/TF64-150 connections with interfaces::

- GT-TAST
- PS/2



View of TF32-65/TF32-104/TF48-121/TF64-150 connections with interfaces:

- ETH1/ETH2
- CAN1/CAN2
- PROFI

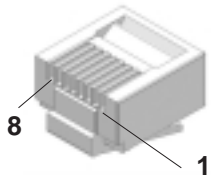


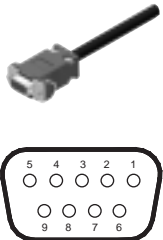
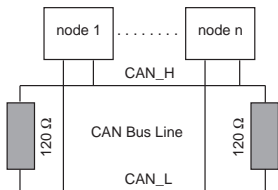
Nr	Name	Version TF					Description
		S0	P2	E0	C0	P0	
1	GT-TAST	•					High-speed serial (Max 50cm),
1	PS/2		•				Standard PS/2 Keyboard Base (Max 1m)
2	ETH 1			•			Ethernet 10/100 Base-T
3	ETH 2			•			Ethernet 10/100 Base-T
4	CAN 1				•		CAN 1 Port
5	CAN 2				•		CAN 2 Port
5	PROFI					•	PROFIBUS DP Port
6	24VDC			•	•	•	Power supply
7	ID 1			•	•	•	Node selector 1
8	ID 2			•	•	•	Node selector 2
9	USB	•	•	•	•	•	Type A connector for USB
10	-						Reserved for future use
11	C16	•	•	•	•	•	16 External contacts
12	LED			•	•	•	LED1 (Green) RUN
							LED2 (Red) FAIL
							LED3 (Yellow) POWER
							LED4 (Yellow) Not use

<sup>(1)</sup> Connector for electromechanical keys: GEFRAN TE5/TE8 keyboards

### External Contacts Connector

Nr	Name	Nr	Name	Nr	Name
1	COMMON 1	7	Contact 6	13	Contact 11
2	Contact 1	8	Contact 7	14	Contact 12
3	Contact 2	9	Contact 8	15	Contact 13
4	Contact 3	10	COMMON 2	16	Contact 14
5	Contact 4	11	Contact 9	17	Contact 15
6	Contact 5	12	Contact 10	18	Contact 16


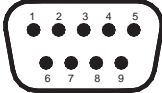
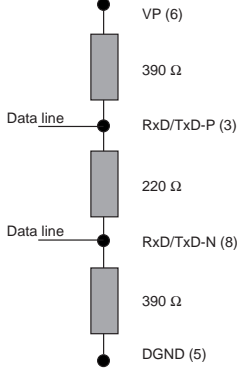
ETHERNET Port					
Protocol		Modbus/TCP (Slave)			
Function		Connect TF to a Modbus/TCP Master (Terminals of GF_VEDO family)			
Baud rate		10/100 Mbit/s (settable via dip-switch)			
Connector		RJ45 conform to CAT5 10/100 BaseT (LED Green = Activity, LED Yellow = Link)			
Address		HW: ID Modbus SW: MAC Address, IP Address			
I/O Input/Output dimensions		8 word Input, 4 word Output			
Msg. supported		0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x0f, 0x10			
Diagnostics (*)	LED 1 (GREEN)	Blinking	1000ms = no communication 200ms = communication state		
	LED 3 (RED)	OFF	No communication error		
		Blinking	Error: not corrected network parameter		
Connector		Signal			Notes
<i>Name</i>	<i>Description</i>	<i>Nr. Pin</i>	<i>Name</i>	<i>Description</i>	
<b>ETH</b>	RJ45 	1	ETH_TX+	TX+	<b>Cable type:</b> Standard cat. 5 according to TIA/EIA-568B
		2	ETH_TX-	TX-	
		3	ETH_RX+	RX+	
		6	ETH_RX-	RX-	
		4,5,7,8	N.C.	N.C.	

CANopen port					
Protocol		CANopen Slave			
Function		Connects TF to a CAN Master device (Terminals of GF_VEDO family)			
Baud rate		10, 20, 50, 100, 125, 250, 500 (default), 800, 1000 kBit/s, HW: set with rotary switches			
Connector		2 D-Sub 9 pin Male (connected in parallel)			
Address		HW: 1...99 set with rotary switches			
EDS file		TF_C01.eds			
Service Data Object (SDO)		1 Server, 0 Client			
Process Data Object (PDO)		1TXPDO, 1RXPDO			
Types (PDO)		Event driven, Event timer, Sync cyclic, Sync acyclic, Remote transmission request			
Predefined messages		Life/node guarding, Heartbeat, Emergency			
CANopen version		DS301 v 4.0			
Device Profile		DS401 v 2.0			
Diagnostics (*)	LED 1 (GREEN)	OFF	Rotary switch movement		
		Blinking	1000ms = "PREPARED" state 200ms = "PREOPERATIONAL" state		
		ON	Fixed = "OPERATIONAL" state		
	LED 2 (RED)	OFF	No communication error		
		Blinking	1000ms = "PREOPERATIONAL - WARNING" error		
		ON	Fixed = "PREOPERATIONAL - BUS OFF" error		
Connector		Signal			Notes
<i>Name</i>	<i>Description</i>	<i>Nr. Pin</i>	<i>Name</i>	<i>Description</i>	
<b>CAN</b>	D-SUB 9 Pin Female 	2	CAN_L	LOW	<b>Cable type:</b> Shielded 2 pairs 22/24AWG conforming to CANopen. Connect the terminal resistances as shown in the figure: 
		3	CAN_GND	GND	
		5	CAN_SHIELD	Shield (Opz)	
		7	CAN_H	HIGH	
		1,4,6,8,9	N.C.	N.C.	

(\*) the behavior of the LED in the TEST modalities is described in the handbook software of keyboards TF



## PROFIBUS port

Protocol		Profibus DP V0 (slave)			
Function		Connect TF to a Profibus DP Master			
Baud rate		Autosincronizzazione (9.6..12000 kBit/s)			
Connector		D-Sub 9 pin Female			
Address		HW: 1...99 set with rotary switches			
I/O Input/Output dimensions		5 Byte Input, 4 Byte Output			
Msg. supported		Data_Exchange, Slave_Diag, Set_Prm, Chk_Cfg, Get_Cfg, Global_Control			
GSD file		FTPBOB42.gsd			
Diagnostics (*)	LED 1 (GREEN)	OFF	Rotary switch movement		
		Blinking	50ms = "AUTOMATIC BAUDRATE RESEARCH" state 250ms = "WAIT FOR PARAMETRIZATION" state 1000ms = "WAIT FOR CONFIGURATION" state		
		ON	Fixed = "DATA EXCHANGE" state		
	LED 2 (RED)	OFF	No communication error		
		Blinking	250ms = "Not Corrected Parameter" error 1000ms = "Not Corrected Configuration" error		
		ON	Fixed = "AUTOMATIC BAUDRATE RESEARCH" state		
Connector		Signal			Notes
Name	Description	Nr. Pin	Name	Description	
<b>PROFI</b>	D-SUB 9 Pin Male    	1	PR_GND	GND	<b>Cable type:</b> Shielded 1 pair 22AWG conforming to PROFIBUS. Connect the terminal resistances as shown in the figure:  
		3	TX+/RX+	TX+/RX+	
		5	PR_SHIELD	SHIELD	
		7	TX-/RX-	TX-/RX-	
		9	+5V	+5V	
		2,4,6,8	N.C.	N.C.	

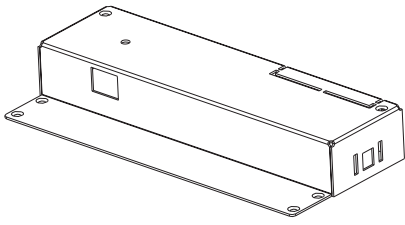
## Other Connectors

Connector		Signals			Notes
Name	Description	Nr. Pin	Name	Description	
<b>GT-TAST</b>	RJ45	-	-	-	<b>Cable type:</b> GT-TAST (50cm) in equipment to the product
<b>PS/2</b>	RJ45	-	-	-	<b>Cable type:</b> PS/2 (90cm) in equipment to the product
<b>24VDC</b>	2 pin connector	1	GND	GND	<b>Cable type:</b> Unipolar with section 1...1,5mm Do not attach lug.
		2	+24V	Supply +24V	
<b>USB</b>	USB (type A)	-	-	-	<b>Cable type:</b> USB (100cm) in equipment to the product. Protection IP65 in equipment to the product

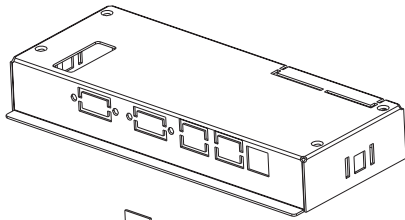
(\*) the behavior of the LED in the TEST modalities is described in the handbook software of keyboards TF

## CARDS

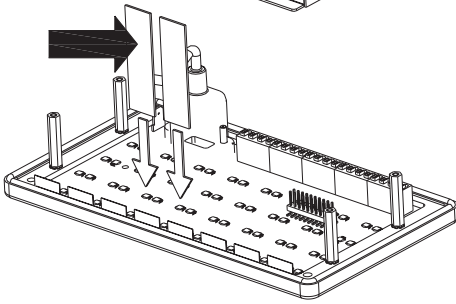
### Example of card insertion



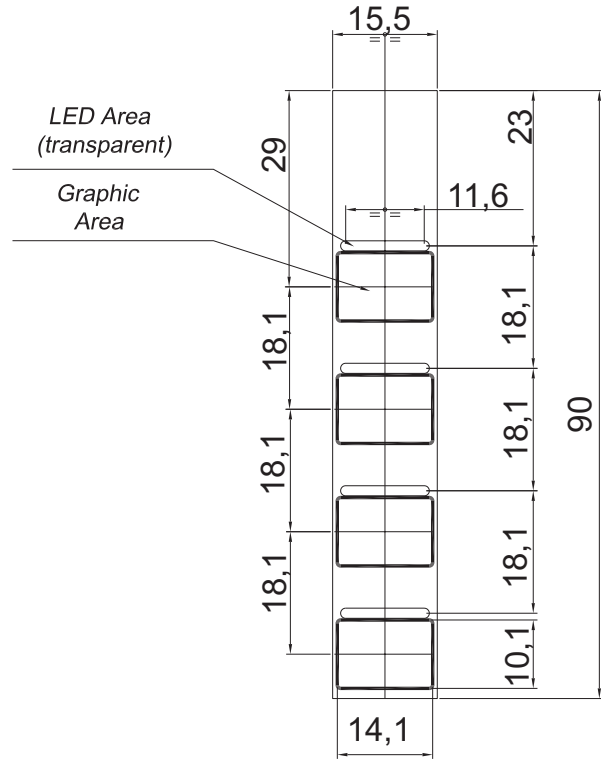
TF32-65-S0  
TF32-65-P2



TF32-65-E0  
TF32-65-C0  
TF32-65-P0



### TF card dimensions



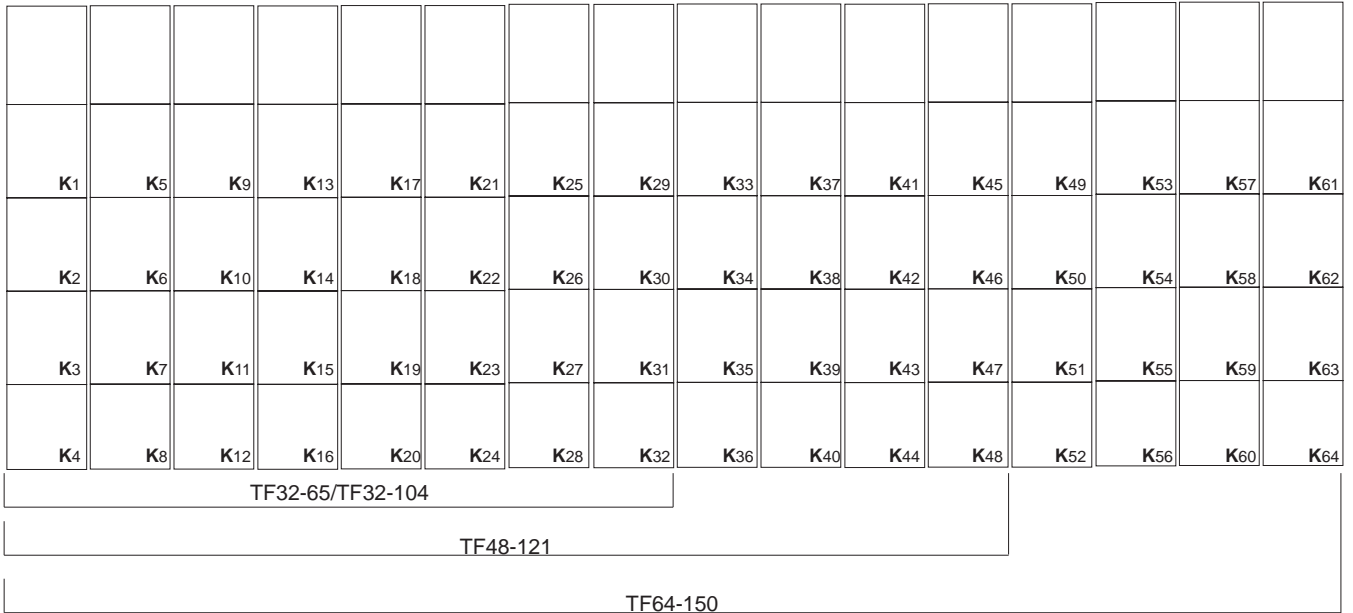
The card is inserted vertically from the top down (seen from the rear, the keyboard has the slot at the top). The arrow shows the printed side of the card.

### Set of TF Injection Cards

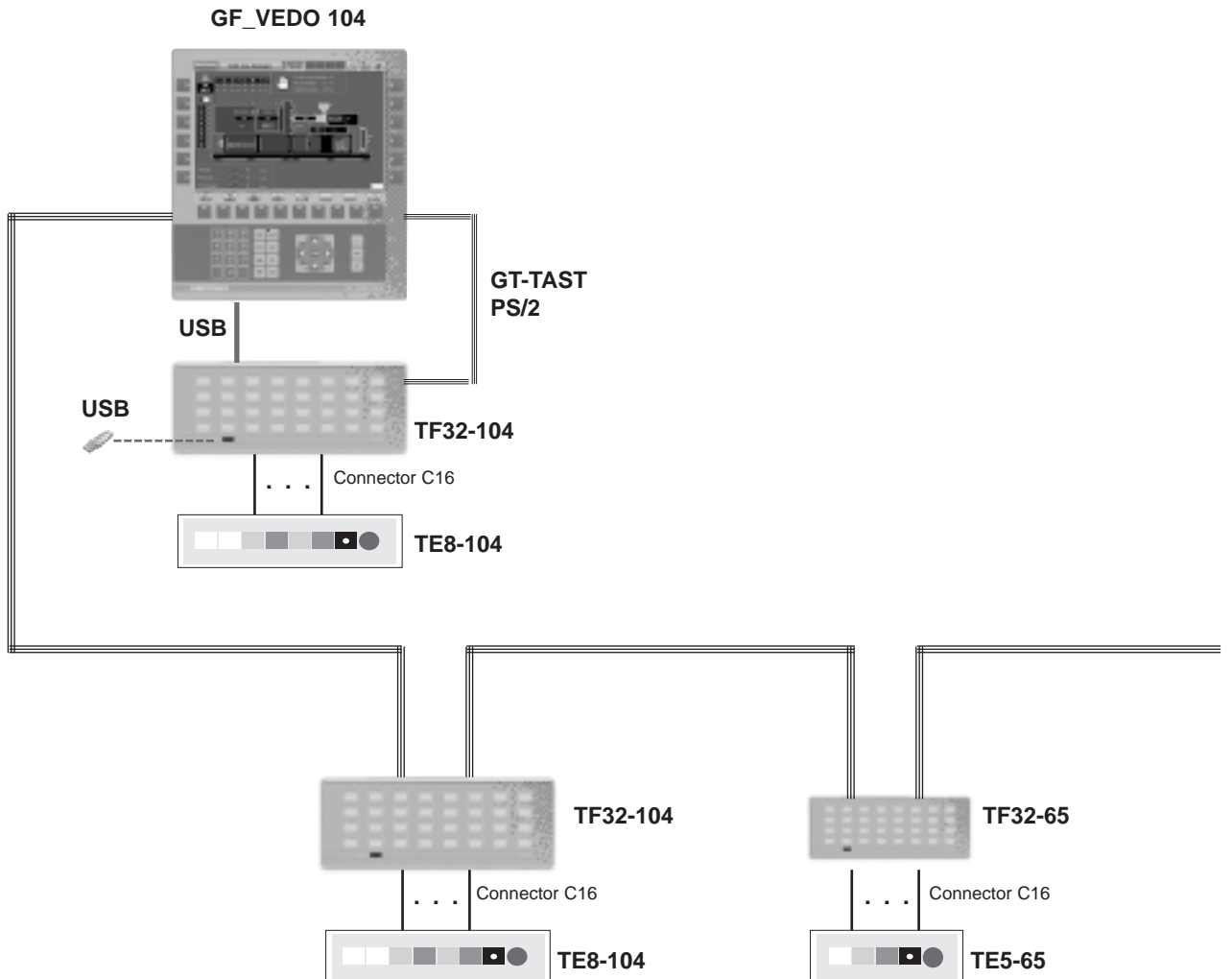
				<b>START</b>			K29	K33	K37	K41	K45	K49	K53	K57	K61				
							K30	K34	K38	K42	K46	K50	K54	K58	K62				
							K31	K35	K39	K43	K47	K51	K55	K59	K63				
							K32	K36	K40	K44	K48	K52	K56	K60	K64				
TF32-65/TF32-104																			
TF48-121																			
TF64-150																			

**CARDS**

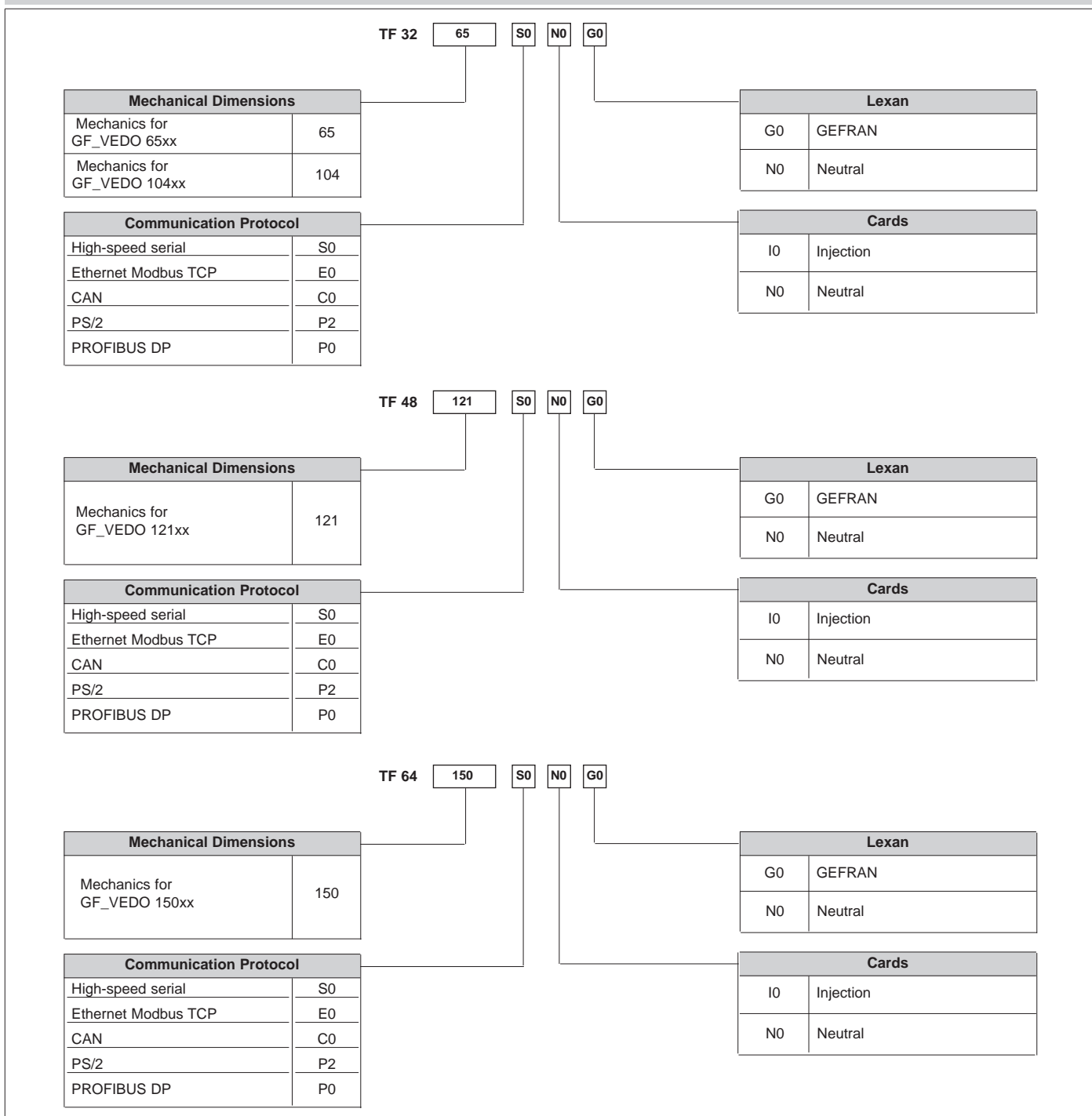
**Set of TF Neutral Cards**



**CONNECTION EXAMPLE**



## ORDER CODE



GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice

## ACCESSORIES

<b>Keyboards</b>	Keyboard to integrate electromechanical keys.....	<b>TE8-104</b>
	Keyboard to integrate electromechanical keys.....	<b>TE5-65</b>



In conformity to ECC 2004/108/CE (EMC) and 2006/95/CE (LVD) with reference to: **EN 61131-2** (product) **EN 61010-1** (safety).

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