SIEMENS

9203

Desigo™ TRA

Room automation stations PXC3.E...

- **Modular, programmable room automation stations for HVAC, lighting, and shading.**
- **BACnet / IP communications; BACnet profile ASC (BTL label).**
- **Optional island bus to connect TX-I/O modules with any data point mix (including bus supply).**
- **Optional KNX PL-Link peripheral bus to connect sensors, actors and room units (including bus supply).**
- **Optional DALI bus to connect ballasts (including bus supply).**
- **Optional Connection of individual devices with KNX S-Mode via KNX PL-Link.**
- **Ethernet switch for communication and tool connection.**
- **USB Device interface.**
- **Operating voltage AC 24 V.**
- **Mounting on standard mounting rail.**

Use

Starting with Desigo V5, PXC3 series room automation stations with Total Room Automation applications (TRA) can be used for buildings with more sophisticated requirements on functionality and flexibility. TRA is used when several disciplines (HVAC, lighting, shading) are combined to form one total solution and when total flexibility is required. TRA is perfect for solutions optimizing energy (class A) without loss of comfort.

Functions

Control of several rooms

A PXC3 series room automation station can assume control for multiple rooms.

These programmable room automation stations provide the infrastructure to provide and process system- and application-specific functions.

Variants

Desigo version	Product No. Stock No.	Function	Number of I/O data points	KNX PL-Link	TX-I/O modules	DALI bus
V6	**PXC3.E16A-100A** S55376-C118	DALI applications only	64 [3]	- -	- -	max. 64 ballasts [4]
	PXC3.E72-100A S55376-C130	typically 4 rooms typically 8 room segments [1]	140 [3]	max. 64 devices	max. 72 physical I/O points	- -
	PXC3.E72A-100A S55376-C131	typically 4 rooms typically 8 room segments [1]	140 [3]	max. 64 devices	max. 72 physical I/O points	max. 64 ballasts [4]
	PXC3.E75-100A S55376-C132	typically 8 rooms typically 16 room segments [1]	280 [3]	max. 64 devices	max. 200 physical I/O points	- -
	PXC3.E75A-100A S55376-C133	typically 8 rooms typically 16 room segments [1]	280 [3]	max. 64 devices	max. 200 physical I/O points	max. 64 ballasts [4]
V5.1 V5.1SP [2]	**PXC3.E72** S55376-C100	typically 4 rooms typically 8 room segments [2]	140 [3]	max. 64 devices	max. 72 physical I/O points	- -
	PXC3.E72A S55376-C101	typically 4 rooms typically 8 room segments [2]	140 [3]	max. 64 devices	max. 72 physical I/O points	max. 64 ballasts [4]
	PXC3.E75 S55376-C102	typically 8 rooms typically 16 room segments [2]	280 [3]	max. 64 devices	max. 200 physical I/O points	- -
	PXC3.E75A S55376-C103	typically 8 rooms typically 16 room segments [2]	280 [3]	max. 64 devices	max. 200 physical I/O points	max. 64 ballasts [4]

[1] Architectural building grid (also called room axis).

[2] If V6 applications are loaded into a V5.1 device, less rooms are supported, because V6 applications require more memory space.
To find out, DCM features the Load calculation tool.

[3] Total number of data point used by TX-I/O, KNX PL-Link and DALI.
For details see Desigo Technical principles CM110664, chapter 18.

[4] Commercially available DALI -ballasts with a DALI address.

Communications

- The room automation stations have a 2-port Ethernet switch to support for low-cost cabling via line topology.
- A USB Device port is available for service and commissioning.
- TX-I/O modules connected directly to the PXC3 allow for direct connection of field devices. This offers maximum flexibility.
- The KNX PL-Link peripheral bus supports room operator units, sensors, and actuating devices. Selected Siemens field devices to the KNX PL-Link bus (devices with the KNX PL-Link logo) can be connected.
  The KNX PL-Link bus supports integration of commercially available devices with KNX S-Mode (requires ETS engineering).
- The DALI bus supports lighting control. Commercially available DALI EBGs (electronic ballasts) can be connected.

Equipment combinations

TX-I/O, KNX PL-Link

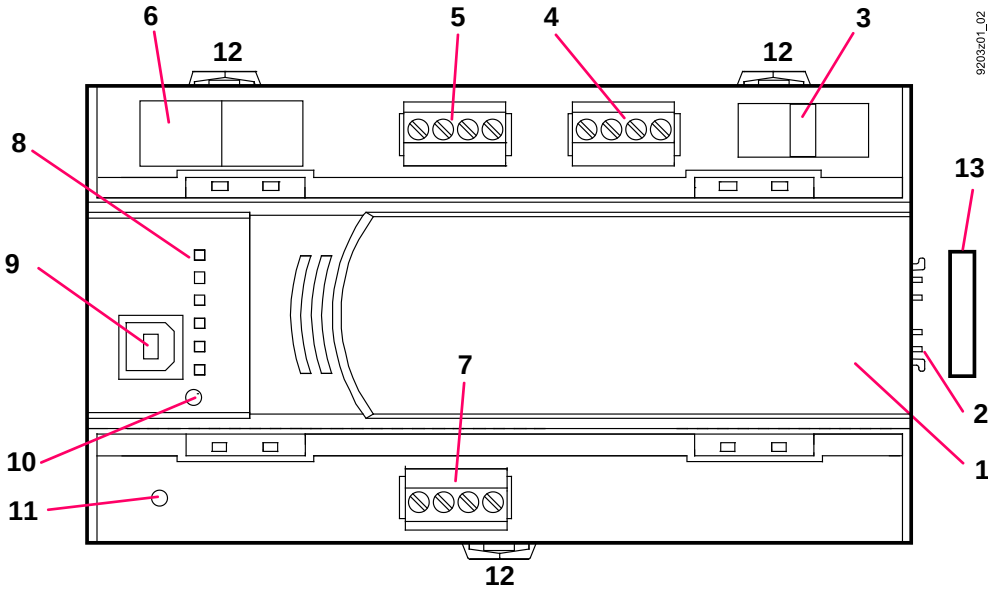
Depending on the type, PXC3 series room automation stations can be operated with **TX-I/O** devices and devices with KNX **PL-Link**.

DALI

DALI device type	Description	Supported
0	Fluorescent Lamps	Yes
7	Switching Function	Yes
1	Self-contained Emergency Lighting	No
3	Low Voltage Halogen Lamps	Partly *)
5	Conversion digital into D.C. Voltage	Partly *)
4	Incandescent Lamps	No
2	HID Discharge Lamps	No
6	LED Modules	Partly *)
8	Colour Control	No
9	Sequencer	No
10	Optical Control	No

*) Partly supported means that basic functions are supported like with type 0, but no further type specific functions.

The compact build allows for mounting the devices on a standard mounting rail.



1 Plastic housing
2 Island bus plug connection
3 T 10 A fuse for AC 24 V peripheral supply via island bus
4 Plug-in terminal block (operating voltage)
5 Plug-in terminal block KNX PL-Link
6 2-port Ethernet switch (with 2 LEDs per port for display purposes)
7 DALI bus
8 LED display for device and system status
9 USB Device interface
10 Service pin
11 Service pin DALI
12 Slider for mounting on DIN rail
13 Island bus cover (supplied with the device)

Power supply

The bus supplies for island bus, KNX PL-Link and DALI are integrated in the room automation station.
For better reliability of the room automation station, the bus supplies and the AC 24 V outlets are independent from the room automations station's own supply.

V6: The bus supplies are switched on by default and can be swiched off via tool if not needed.
V5.1: The bus supplies are switched off automatically as long as no device is connected to the respective bus during engineering.
V5.1 devices do NOT support the V6 functionality of field bus supply management.

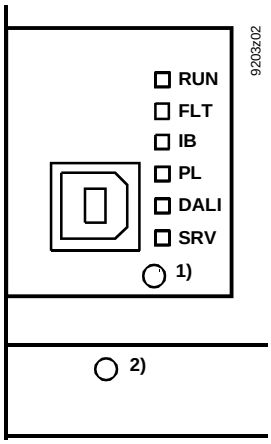
KNX PL-Link supply

The internal KNX PL-Link supply must not be operated in parallel with an external supply. It must be switched off via tool when using an external supply. This is typically the case if the devices connected to the KNX PL-Link consume more than the 160 mA available from the internal supply.

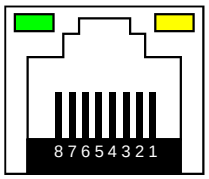
Island bus supply

The internal bus supplies can be reinforced by external power supply modules. An additional TXS1.12F10 supply module must be switched on and off at the same time as the room automation station. Otherwise, DC 24 V island bus supply may sag, resulting in alarms.

LED indicators (depending on the type)

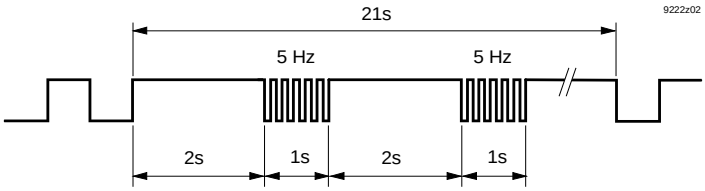


1) Service pin
2) Service pin DALI



LED	Color	Activity	Function
RUN	Green	Continuously ON Continuously OFF Flashing	Device ready to operate. No supply for device. Start-up or program halted
FLT	Red	Continuously OFF Continuously ON Rapid flashing	OK HW or SW error. Wrong or corrupted application.
IB	Yellow	Continuously ON Flashing Continuously OFF	OK. Island bus communication. No modules connected TX-I/O modules not configured or communication fault.
PL	Yellow	Continuously ON Flashing Continuously OFF	OK. KNX PL-Link communication. KNX PL-Link not used or communication fault.
DALI	Yellow	Continuously ON Flashing Continuously OFF	OK DALI bus communication DALI not used or communication fault.
SVC	Red	Continuously OFF Blinking Blinking per wink command*)	OK. No application loaded. Physical identification of the room automation station.
Ether-net 1 / 2	Green	Continuously ON Continuously OFF Flashing	Link active Link inactive Network activity
	Yellow	Continuously ON Continuously OFF	Link 100 Mbps Link 10 Mbps

*) Wink command pattern:



Service pins
(depending on the type)

Pin	Action	Description	
1)	Short press	Ethernet	Physical identification of the room automation station in the network.
2)	Short press	DALI test:	All ballasts On or Off.
	Long press	DALI test:	Start / stop the following function: "All ballasts blink (2 s On, 2 s Off)".

Product documentation

- Engineering and commissioning: See ABT online help.
- Installation manual Desigo TRA, CM111043.
- TX-I/O planning and installation manual, CM110562.
- Application Guide for IP Networks in Building Automation Systems, CM110668.
- Desigo Technical principles CM110664, chapters 18 and 26.

Engineering

- Each device has a unique serial number for commissioning support.
  It is also located on the removable barcode label: See the ABT online help for the associated workflow.
- Each device has a unique MAC address.
- Each device with KNX PL-Link has a unique KNX ID.
- Cable length, topology, etc.: See installation manual Desigo TRA, CM111043.
- The cable insulation must always comply with the present rated voltage.

Caution! ⚠

- When the supply voltage of the room automation station is transited to external devices, the cable **cross section** must always correspond to the rated current of the safety circuit breaking device.
  Observe local regulations in any case.

Mounting

The room automation stations can be snapped onto a standard mounting rail.

The automation station has pluggable screw terminal blocks to connect the AC 24 V supply, the AC 24 V outlets, the KNX PL-Link, and the DALI bus.

The TX-I/O modules are snapped onto the mounting rail on the right side of the room automation station. The island bus is created automatically in this process.

Mounting position

Recommended	**With restrictions *)**
• Wall, horizontal from left to right or from right to left	• Over head. • On a horizontal surface. • Wall, vertical from bottom to top or from top to bottom.
Ambient temperature -5...50 °C / 23...122 °F	**Ambient temperature -5...45 °C / 23...122 °F *)**

*) 50 °C / 122 °F is admissible if the bus supplies use max. 2/3 of the specified load: KNX PL-Link 105mA, DALI 85mA and island bus 400mA.
PXC3.E16A-100A: 50 °C / 122 °F is admissible without restrictions.

Note **You must ensure, however, that sufficient ventilation is available to maintain the permissible ambient temperature for the devices (inside the cabinet / installation box).**
Outside, the temperature must be 10 K lower.

Installation

See installation manual Desigo TRA, CM111043.

STOP **Note!**

Island bus Polarity: If a TXS1.12F10 supply module is connected to output ↑ 24 V, do not invert ~ and ⊥.

The devices are not damaged but island bus communications will not work.

Operation

If island bus or USB communications do not work, this is an indicator that the AC 24 V operating voltage is incorrectly wired (conductors ~ and ⊥ inverted).

Technical data

Operating voltage (24V~, ⊥)	Safety extra-low voltage SELV or protection by extra-low voltage PELV		AC 24 V -15 % / +20% 48...63 Hz
	Half-wave load		Symmetric
Operating data	Processor	PXC3.E...-100A (V6)	Texas Instruments AM3352, 600 MHz
		PXC3.E7... (V5.1)	Atmel AT91SAM9G20, 400 MHz
	Memory	PXC3.E...-100A (V6)	512 MB SDRAM (DDR3) 512 MB NAND Flash
		PXC3.E7... (V5.1)	128 MB SDRAM (SDR) 256 MB NAND Flash
Power consumption	**Max. permissible input current AC 24 V (through terminals 5 and 6)**		**Total max. 10 A (Ext. fusing compulsory: max. T 10 A melting fuse or max. C 10 A circuit breaker)**
	Base load (without loading by modules and field devices)		8 VA / 0.33 A
	Island bus supply *)		30 VA / 1.25 A
	KNX PL-Link supply *) **)		12 VA / 0.50 A
	DALI supply *)		9 VA / 0.37 A
	*) The bus supplies can be switched off via tool if not used. **) The NX PL-Link supply MUST be switched off via tool if an external bus supply is used.		
Transit power AC 24 V	TX-IO (island bus)		144 VA / 6 A
	KNX PL-Link: AC 24V (terminals 3, 4)		48 VA / 2 A
	AC 24 V / 6 A (terminals 7 and 8, for additional AC 24 V consumers)		144 VA / 6 A (only if the sum of 10 A at terminals 5 and 6 is not exceeded)
Fusing of the supply outputs for field supply	AC 24 V /2 A ↑ (KNX PL-Link, terminals 3 and 4)		PTC resistor, short-circuit proof
Caution! ⚠	AC 24 V ↑ (terminals 7 and 8)		No internal fusing
	Island bus conductor V~		T 10A fuse (slow, exchangeable)
Response to power / communication failure	• Energy reserve (supercap) to support real-time clock (3 days). • Start-up time after power failure: approx. 90 s		
Ethernet interface	Plug		2 x RJ45, screened
	Interface type		100BaseTX, IEEE 802.3 compatible
	Bit rate		10 / 100 Mbps, autosensing
	Protocol		BACnet over UDP/IP
USB interface	Plug		Type B (USB device)
	Data rate (USB 1.1)		12MBit/s
	Galvanic isolation of ⊥		No
	Protective circuit against surges and over current		Yes (balancing currents are limited, also in the GND conductor)

Island bus interface		
Communications	Interface type	Siemens specific protocol
DC output	Nominal voltage	DC 24V
	Max. current	600 mA (sufficient for typically 8 TX-I/O modules)
	Parallel switchable with 3 supply modules TXS1.12F10	For details, see: TX-I/O planning and installation manual, CM110562)
	Short-circuit proof, overload-proof	Self-resetting
	Protection	Short-circuit proof
Island bus connector on side	Protection against faulty wiring with AC 24 V	No electric protection. Use the terminal cover.
KNX PL-Link interface		
Communications	Interface type	KNX, galvanically separated
	Transceiver	TP-UART
	Baud rate	9.6 kbps
Bus power supply	Nominal voltage	DC 29 V
	Max. supply *Note: for devices with higher power requirement, use the output AC 24 V 2 A, see above.*	160 mA for max 32 devices with KNX PL-Link. Default: Auto detection; must be turned off via ABT if external bus supply is used. Up to 64 devices with KNX PL-Link can be operated using one or two external bus supplies.
	Protection	Short-circuit proof Protection against miswiring up to AC 24 V
DALI interface		
Communications	Interface type	DALI, galvanically separated
	Baud rate	1.2 kBit/s
	Insulation strength	Reinforced insulation for 230 V (1.5 kV) Suitable for installations in overvoltage category III (4 kV).
Bus power supply	Nominal voltage	DC 16 V
	Max. current	128 mA for max 64 DALI devices
	Protection	Short-circuit proof Upon power-on, AC 230 V bus voltage is recognized on terminals DA+ and DA–.
	NO protection against miswiring with AC 24 V or AC 230 V: Voltage between DA+ / DA+ or between DA– / DA– will destroy the DALI PCB!	
Wiring, topology, cable length, cross section	See installation manual TRA, CM111043.	
Connection terminals, plug-in	Construction type	Pluggable screw terminals
	Copper-wire or Cu-strand with wire end sleeve	1 x 0.6 mm dia. to 2.5 mm^2 (22 to 14 AWG) or 2 x 0.6 mm dia. to 1,0 mm^2 (22 to 18 AWG)
	Copper-strand without wire end sleeve	1 x 0.6 mm dia. to 2.5 mm^2 (22 to 14 AWG) or 2 x 0.6 mm∅ to 1.5 mm^2 (22 to 16 AWG)
	Screwdriver	Slot screws Screwdriver, size 1
	Max. tightening torque	0.6 Nm (0.44 lb-ft)

Assignment as per EN 60730	Operation of automatic controller	Type 1
	Degree of pollution	2
	Construction type	Protection class III
Housing protection standard	Protection type as per EN 60529	
	Front parts in the DIN section	IP30
	Terminal part	IP20
Ambient conditions	Operation	As per IEC 60721-3-3
	Climatic conditions	Class 3K5
	Temperature (see page 6)	-5 ... 50 / 45 °C (23...122/113 °F)
	Humidity	5…95% r.h.
	Mechanical conditions	Class 3M2
	Transport	As per IEC 60721-3-2
	Climatic conditions	Class 2K3
	Temperature	-25...70 °C (-13 ...158 °F)
	Humidity	5…95% r.h.
	Mechanical conditions	Class 2M2
Standards, directives and approvals	Product standard	EN 60730-1
	Product family standard	
	General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)	EN 50491-2 EN 50491-3 EN 50491-5
	EU conformity (CE)	See CM1T9203xx *)
	Electromagnetic compatibility (EMC)	For use in residential, commercial and industrial environments
	RCM-conformity (EMC)	See CM1T9222en_C1 *)
	UL approbation	UL 916
	EAC Eurasian conformity	For all PXC3.E...-100A types

Meets the requirements for eu.bac certification (excepted PXC3.E16A-100A).
See product list on: http://www.eubaccert.org/licences-by-criteria.asp

License	Application		Control accuracy [K]
212196	Fan-Coil 4-pipe	Heating / Cooling	0.3 / 0.1

Environmental compatibility	The product environmental declaration CM1E9203 *) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal)	ISO 14001 (Environment) ISO 9001 (Quality)

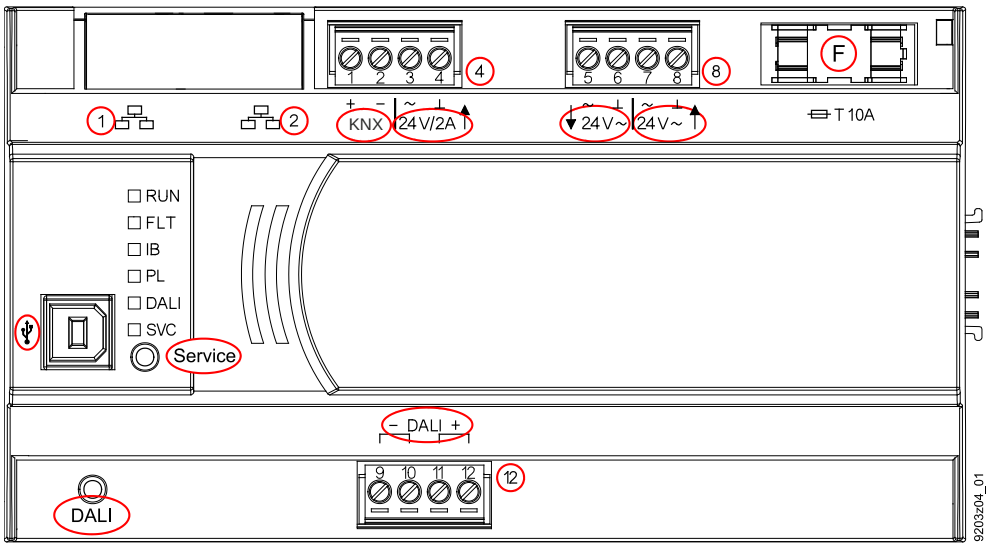
*) The documents can be downloaded from http://siemens.com/bt/download.

Color	Housing	RAL 7035 (light-gray)
Dimensions	Housing as per DIN 43 880, see dimensions	
Weight Without / with packaging	PXC3.E7x....	349g / 392g
	PXC3.E7xA...	373g / 416g
	PXC3.E16A...	347g / 390g

Disposal

The devices are considered electronics devices for disposal in terms of European Directive 2012/19/EU (WEEE) and may not be disposed of as domestic waste.
Dispose of the devices via the proper channels.
Follow all local and currently applicable laws and regulations.

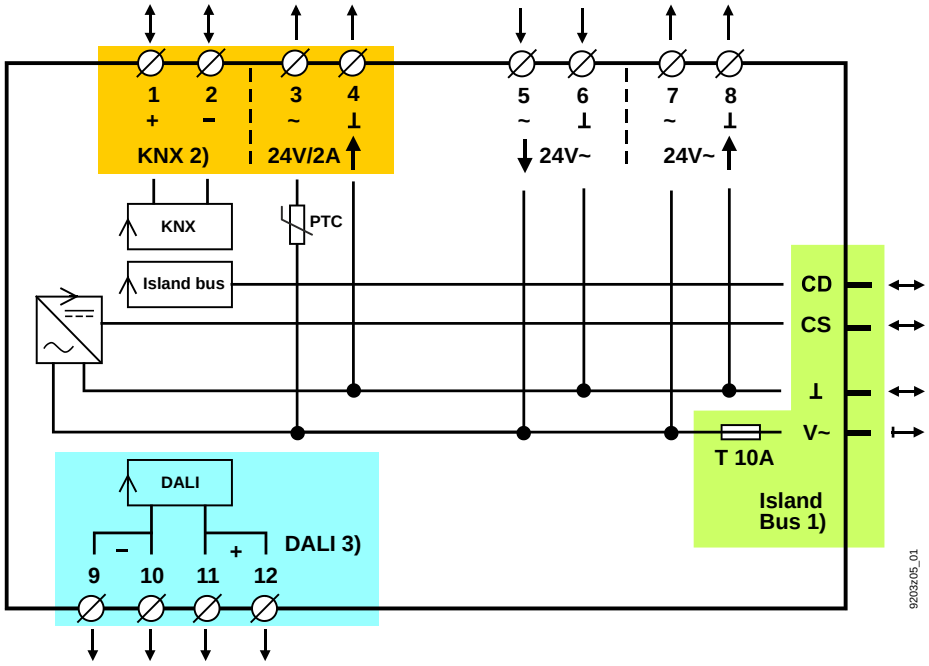
Connection terminals and interfaces



			PXC3.E7x...	PXC3.E7xA...	PXC3.E16A-100A
1, 2		2 x RJ45 interface for Ethernet (2-port Ethernet switch)	X	X	X
4 KNX	+, –	KNX PL-Link connection	X	X	*)
4 24 V / 2A ↑	~, ⊥, 2 A	Output AC 24 V for externally supplied devices with KNX PL-Link (Short-circuit proof with PTC resistor)	X	X	*)
8 ↓ 24 V~	~, ⊥	Operating voltage AC 24 V	X	X	X
8 24 V ↑	~, ⊥, 6 A	Output AC 24 V to supply other PXC3... room automation stations (internally connected to ↓ 24 V on pcb – **no internal fusing**)	X	X	X
F		T 10 A fuse for island bus conductor V~	X	X	*)
	USB	USB interface	X	X	X
12	DALI	DALI bus connection	*)	X	X
Service		Service pin Ethernet	X	X	X
DALI		DALI test	*)	X	X
(Without labels)	Island bus	The island bus is created automatically when TX-I/O devices are snapped on the standard mounting rail	X	X	*)

*) Fitted, but no labeling and no function in this type

Basic circuit diagram
(connections AC 24 V, fusing)



1), 2) Not with PXC3.E16A-100A
3) Only with PXC3.E....A... types

Dimensions

All dimensions in mm