> COMFORTE CX2 EN CX2E BASE MODULES

Comforte line

Characteristics

- part of the Comforte line
- compact
- modular construction
- integrated climate control, lighting and sunblind control
- flexibility
- programming, configuration and maintenance using Top Control
- efficient installation
- can be combined with a wide range of I/O modules
- Roombus interface

Part of the Comforte line

The Comforte CX2, Comforte CX2E and Comforte CX2 VAV are part of the Comforte line.

Difference between Comforte CX2 and Comforte CX2E

The connectors for power supply and I/O are spring clamps on the Comforte CX2 and a pluggable terminal block on the Comforte CX2E. The pluggable terminal block makes installation quicker and more efficient, because the wiring can be connected to the terminals before they are mounted on the Comforte CX2E.

Compact

The Comforte line is a range of compact, multi-functional and modular room control units that are specifically intended for working areas and accommodation in for example office buildings, education institutions, care establishments or hotels. The Comforte line maintains an environment in each individual room that offers maximum comfort for working or other activities.

Modular construction

With its modular construction consisting of a base module, power supply module and various different output modules the system can be adapted to the installation space available. The software follows the same principles as the hardware and is also modular in design. The Comforte line can accommodate a large range of control functions including induction systems, VAV systems, fan-coil systems, cooled ceilings and air conditioned ceilings.

Native BACnet

The Comforte is a "native BACnet application specific controller" (B-ASC) that communicates with other room control units and the controller via the BACnet MS/TP. BACnet is open, manufacturer independent and can be freely implemented. The configuring and addressing of BACnet is handled entirely by Priva Top Control.

Roombus interface

The Comforte CX2(E) and Comforte CX2 VAV are equipped with a Roombus interface. The Roombus interface is an interface for communicating with and supplying power to Priva Roombus devices. Examples of Priva Roombus devices include smart sensors, actuators and control terminals. The Roombus interface is Priva's own implementation of the Modbus interface.

Integrated climate control, lighting and sun protection

In addition to heating, cooling and ventilation, the Comforte line can also control lighting and sun blinds. This level of control integration offers greater individual comfort, reduced energy consumption and lower installation costs. Controlling the climate, heating and sun blinds requires only a single operating unit: the Comset CX. This enhances user-friendliness, is more attractive in terms of appearance and reduces installation effort and materials.

100% Priva Top Control

The automatic control and operating software for the Comforte line is programmed, configured and maintained using Priva Top Control, the complete software family for intelligent building control, in which applications work closely together with each other and with the Priva Blue ID controllers. The entire building can be effectively automated and managed from an integrated environment. Top Control is based on an extensive range of freely configurable control modules and a powerful and flexible graphical programming environment. Compiling and programming the automatic control software automatically creates the basis for the various operational modes. This results in highly maintainable systems, which can be tendered out with relative ease: the user's guarantee of controlled costs during the entire service life of the equipment. Priva hardware and software offers greater freedom and security.

Operation

The Comforte CX2(E) and Comforte CX2 VAV offer various control units. The user can easily control the climate in the room or zone using a single control unit. The control unit allows the user to read information or control the equipment for, for instance, heating or ventilation that controls the climate.

The Comforte CX2(E) and Comforte CX2 VAV support the following control units:

- Touchpoint One
- Touchpoint One Hotel
- Touchpoint Nano
- Comset CX

All of these control units are available in various designs. This allows the most suitable control unit to be selected for each room, zone or application.

Standard switchgear

If required, standard switchgear can be used to operate the Comforte line. A light switch for example. The switchgear needs only be connected to the digital and universal inputs of the Comforte line for this.

System composition

The Comforte is a modular system that has been designed specifically with quick and easy installation in mind: a complete control system can be engineered in just seconds by clicking in the base module and the I/O modules. The associated power supply ties in perfectly with this and also provides power for the thermoelectric drives for shut-off valves and for active sensors.

Efficient installation

The Comforte is suitable for mounting on a DIN rail or on a back plate. All modules are dimensioned to DIN 43880 and are a full number of standard units of measure wide. All connectors are freely accessible. The housing is equipped with integral eyes that can be used to fasten cable trusses in place using tie-wraps.

Modules with GST18 connectors are available for connecting low-voltage power supplies and controls. They can be installed quickly and prefabricated. These features make installing the Comforte in the area above the suspended ceiling a quick and convenient process. Moreover, as GST18 connectors are common to almost all electrical systems, a wide range of pre-assembled installation materials can be used. The intrinsic safety of the GST18 connector design obviates the need for an additional housing for the Comforte. At the same time, the GST18 connector acts as a local isolator and strain relief device, meaning that savings can be made in installation time and components. All Comforte modules can be supplied with spring clamps for specific applications. The Comforte CX2E base module and the power supply modules are also available with a pluggable terminal block.

There is no need to fit extra terminal strips when installing the Comforte CX, as an adequate number of terminals are provided for each individual input and output; common terminals are not used. Each I/O module has its own three-pin connection for the 230 VAC supply voltage. This means that the outputs of different Comforte modules can be fed via separate electrical groups.

The Comforte-line range

Name	Description
Comforte CX base module	module with processor, memory, communication and I/O on the main circuit board
Comforte CX2 base module	
Comforte CX2E base module	
Power supply module PS230-30 (GST/SC)	module for 24 VAC power supply to base module, I/O modules and any sensors and actuators
Power supply module PS230-30E (GST/terminal block)	
Roombus power supply module PS230-30-15RE (GST/terminal block)	module for: • 24 VAC power supply to base module, I/O modules and any sensors and actuators • 24 VDC power supply and neutral point connection of Roombus devices
Fan module RO1-3 (GST/SC)	I/O module with relay for fan control (on/off, 2 or 3 speed)
Lighting module RO2-1L (GST/SC)	I/O module with relay for switching 2 lighting groups on/off
Lighting module RO2-1L NC (GST/SC)	I/O module with relay (normally closed) for switching 2 lighting groups on/off
Sun blind module RO2-2 (GST/SC)	I/O module with relay for controlling 2 sun blind motors
Sun blind module RO2-2 DC (BL/SC)	I/O module with relay for controlling 2 sun blind motors
TRIAC output module SO4-1 (GST/SC)	I/O module with 4 TRIAC outputs
Analogue output module AO2-1 (GST/SC)	I/O module with 2 analogue outputs
Comset CX	Operating unit

General specifications of the Comforte line

Housing	
Material	aluminium with plastic end plates
Colour	aluminium with grey-black (RAL 7021) end plates
Shape	as per DIN 43880
IEC protection class	I (basic insulation with earth wire)
IP code	IP20 (NEN-EN-IEC 60529)
Flammability	HB
Recycle code	7
Mounting [1]	snaps onto DIN rail on gusset plate using 4x M5 bolts (maximum screw depth: 5.5 mm) in an enclosed control panel, distribution box, above a suspended ceiling or in a public space

[1] In the case of installation in a closed housing, Priva recommends applying ventilation openings in the housing. This will reduce the temperature of the electronic components and thus extend the service life. The temperature in the housing must always be within the specified permissible temperatures.

Environment	
Permissible temperature when system operating	0 ... 50°C
Permitted temperature during transport and storage	-20 ... 70°C
Permissible ambient relative humidity	80% at T <= 30°C, decreasing linearly to 50% at T = 40°C (non condensing)
Installation category	II
Permitted ambient pollution	pollution degree 2

Legislation and standards	
EC Declaration of Conformity	The Comforte CX line is in accordance with the following directives and associated standards and normative documents: • Low Voltage Directive 2014/35/EU • EMC Directive 2014/30/EU Safety standard: • EN 61010-1: 2010 EMC standards: • EN 61326-1 (2013) • EN 61000-6-1 (2007) • EN 61000-6-2 (2005) + AC (2005) • EN 61000-6-3 (2007) + A1 (2011) • EN 61000-3-2 (2006) + A1 (2009) + A2 (2009) • EN 61000-3-3 (2008) • WEEE directive 2012/19/EU • RoHS directive 2011/65/EU You can find an original version of the EC Declaration of Conformity on the Priva Support Portal: https://support.priva.nl.

I/O connections	
Type of connector (module dependent)	spring clamps pluggable terminal block plug-in GST18 connector plug-in screw connectors

Spring clamps	
Permitted core cross section area	solid or flexible: 0.5 to 2.5 mm² flexible with crimp-on terminal in accordance with DIN 46228/1: 0.25 to 1.5 mm²

Terminal block: RS485 connector	
Permitted core cross section area	solid: 0.2 ... 1.5 mm² (25 ... 16 AWG) flexible with crimp-on terminal: 0.2 ... 1.0 mm² (25 ... 17 AWG)
Strip length/connector length	solid: 8 mm (0.31 inch) flexible with crimp-on terminal: 8 mm (0.31 inch)

Other terminal blocks	
Permitted core cross section area	solid: 0.2 ... 2.5 mm² (25 ... 14 AWG) flexible with crimp-on terminal: 0.2 ... 2.5 mm² (25 ... 14 AWG) flexible with double ferrule connector: 0.2 ... 1.5 mm² (25 ... 16 AWG)
Strip length/connector length	solid: 10 mm (0.39 inch) flexible with crimp-on terminal: 10 mm (0.39 inch) flexible with double ferrule connector: 12 mm (0.47 inch)

Base module specifications

General			
Article	Comforte CX base module	Comforte CX2 base module	Comforte CX2E base module
Article number	400322	400332	400334
Dimensions	144 x 90 x 49 (WxHxD in mm) (8TE)		
Weight	330 grams		
Indication	Green function LED indicates that the module is working correctly (LED1). Red LED indicates power supply connection problem (LED2).		

Power supply		
Supply voltage	24 VAC ±25 %	
Required mains frequency	50 Hz / 60 Hz	
Power supply connector type	7-pin spring clamps (double feed terminals for loop through)	7-pin pluggable terminal block
Earth wire cross section	2.5 mm^2	
Maximum fuse value for external fuses (applies if the Comforte CX power supply module is not used)	3.15 A(T) (in accordance with EN 60127-2 page III)	
Maximum used power - base module*	5.8 VA	
Maximum used power - base module including Comset CX, I/O modules and Roombus*	17 VA	
Supply voltage for Comset CX, I/O modules and Roombus	16 V (-10%/+5%)	
Available supply current for Comset CX, I/O modules and Roombus	310 mA	

*Excluding the load on the DOC and 24~ terminals

Communication with Comforte I/O modules		
Maximum no. of I/O modules per base module	Total: Fan module RO1-3: Lighting module RO2-1L or RO2-1L NC: Sunblind module RO2-2 or RO2-2 DC: TRIAC output module SO4-1: Analogue output module AO2-1:	5 I/O modules * 1 3 2 1 2
Type of connector used for the connection between the base and I/O modules and from I/O module to I/O module	RJ45	
Maximum cable length between the base and I/O modules and from I/O module to I/O module	15 cm (cable is included)	
No. of cores used	2: the system meets the requirements of EN 61000-6-1 3 (the Comforte is connected to the electrical earth via the communication cable): the system meets the requirements of EN 61000-6-2 (industrial standard)	

* When 2 Sunblind modules are used a total of 4 I/O modules applies.

Communication with Comset CX operating unit	
Maximum number of operating units	1
Type of connector	RJ45 8-8 or RJ45 8-6
Cable type	unshielded, with 6 or 8 cores (e.g. UTP)
Maximum cable length	25 m

BACnet communication	
Protocol	BACnet MS/TP
Network designation	BACnet
Driver required (per RS485 port)	Priva Blue ID Comforte Data network driver *
Article number	508411
Communication type	RS485
Baud rate	38k4 bps
Maximum no. of Comforte control units per S10 controller	75
Maximum number of Comforte control units per C4 controller	75

* Only suitable for the Comforte, i.e. not suitable for other BACnet devices.

BACnet communication		
Permissible network topology*	Bus network	
Required cable type	Twisted pair	CAT5e UTP CAT5e FTP**
Maximum total cable length	400 m	1000 m
Maximum cable capacitance	100 pF/m	-
Minimum core cross section	0.2 mm^2	-
Termination	None	None

Reaction time	
Reaction time – Comset CX to Comforte	On average within 0.3 seconds
Reaction time – Comforte to another Comforte in the same BACnet	On average within 0.7 seconds*
Reaction time – Comforte to controller via BACnet	On average within 0.5 seconds*
Reaction time – controller to Comforte via BACnet	On average within 0.5 seconds*

* The reaction times indicated are based on data network loads during normal operation and do not apply during commissioning or during data collection when data transfer takes place. The reaction time for processing within the controller depends on the load such as software and serial communication. This reaction time can be determined by practical tests.

Roombus interface communication	
Protocol	Modbus RTU
Communication type	RS485
Baud rate	115k2 bps
Maximum total number of Roombus devices in one Roombus	10
Maximum number of Roombus devices of the same type in one Roombus	Multisensor MS4R: 8 DALI-S2R converter: 3 Other Roombus devices: 1
Data format	Data bits: 8 Parity: Even Stop bits: 1
Permitted network topology	bus or star network
Cable type	twisted pair, with 8 cores in accordance with TIA/EIA 568B
Type of connector	screened RJ45 8-8 V+: 1.5 0: 2,4,7,8 A: 3 B: 6
Maximum total cable length	100 m
Maximum cable length from Roombus devices to power supply	25 m
Maximum cable length between the two outermost Roombus devices	50 m
Maximum cable length between the end of the Roombus cable and the Roombus Termination Module	5 m
Maximum cable capacitance	< 50 pF/m
Cross section	0.2 ... 0.3 mm² (24 ... 22 AWG)

Digital inputs specifications

Digital inputs	
Number	3
Type of connector	Comforte CX2: spring clamps Comforte CX2E: pluggable terminal block
Usage	voltage-free contact to GND open collector output
Configuration option	the digital inputs can be inverted in TC Engineer (software setting)
Internal resistance	10 kOhm
Nominal voltage on input without load	5 VDC
Minimum high input voltage with open contact	3.4 VDC
Maximum low input voltage with closed contact	1.6 VDC
Minimum resistance with open contact	20 kOhm
Maximum resistance with closed contact	5 kOhm
Nominal sampling time	8 ms
Maximum permissible input voltage	-50 ... +50 VDC

Universal input specifications

Universal analogue inputs used	
Number of universal inputs	maximum 2 (Comforte CX) maximum 4 (Comforte CX2 and CX2E) per input, choice of analogue or digital
Type of connector	Comforte CX2: spring clamps Comforte CX2E: pluggable terminal block

Universal analogue inputs used	
Configurable measurement type	voltage via definable characteristic Belparts SP-A94, SP-A95 Betec NTC 10K DIN 43760 NI1000 temperature sensor ECS Versatemp IBK Honeywell 20 kOhm range Priva temperature sensor 50K Priva temperature sensor 3K PT1000 Sauter EGT335 potentiometer Siemens LG-NI1000 temperature sensor Siemens QAA25 potentiometer Siemens QAA27 potentiometer Staefa F-T1 Thermokon TK5000 NI1000 temperature sensor linear potentiometer for temperature setting (twin wire connected via 0 and wiper), 1 or 10 kOhm, relative range (-3 to 3 °C) or absolute range (10 to 30 °C) adjustable offset for the measurement result
Maximum input leakage current (0 to 5 V)	±20 nA
Maximum input leakage current (5 to 10 V)	±20 nA + ((U_{UI} - 5)/5 kOhm) mA[1]
Measurement range	0 - 10 VDC
Resolution	250 µV
Accuracy of voltage measurement (0 to 5 V)	± (2 mV + 0.5 % of measurement)
Accuracy of voltage measurement (5 to 10 V)	±(2 mV + 0.6% of the measurement)
Accuracy of relative voltage measurement (0 to 5 V)	± 2 mV (applicable in the case of resistance measurement)
Maximum input voltage	-50 - +50 VDC
24~ power supply connection for active sensors	same as supply voltage

[1] The output of the sensor which is connected to the input of the universal input must be able to supply at least 1 mA current at an output voltage of 10 V.

Universal inputs for digital use	
Number of universal inputs	maximum 2 (Comforte CX) maximum 4 (Comforte CX2 and CX2E) per input, choice of analogue or digital
Type of connector	Comforte CX2: spring clamps Comforte CX2E: pluggable terminal block
Usage	voltage-free contact to GND
Configuration option	the digital inputs can be inverted in TC Engineer (software setting)
Minimum open contact resistance	20 kOhm
Maximum closed contact resistance	5 kOhm
Maximum sample time	300 ms

Digital output specifications

Digital outputs	
Number	3
Type of connector	Comforte CX2: spring clamps Comforte CX2E: pluggable terminal block
Output type	solid-state
Configuration option	the digital outputs can be inverted in TC Engineer (software setting)
Switching voltage on DOC terminal	same as supply voltage
Maximum load current per output (continuous)	0.5 A
Maximum load current load per output (during 2 minutes)	0.8 A
Overload protection	In the event of an overload, the outputs are switched off and disabled. This lock can be lifted in TC Engineer.
Maximum current overload safety (per 3 outputs)	2.5 to 4 A

Analogue output specifications

Analogue outputs	
Number	2
Type of connector	Comforte CX2: spring clamps Comforte CX2E: pluggable terminal block
Control range	0-10 VDC
Maximum current load per output	4 mA
Minimum load impedance	2.5 kOhm
Resolution	1 mV
Accuracy	±(20 mV +0.5% of the control)
Protection	Protection against short-circuit to GND Protection against connection to voltages up to 30 VAC
Output characteristics	logarithmic light characteristic 0% – 100% = 0.0 - 10.0 V 0% – 100% = 10.0 - 0.0 V 0% – 1% – 100% = 0.0 – 2.0 – 10.0 V 0% – 99% – 100% = 10.0 – 1.8 – 0.0 V 0% – 100% = 2.0 - 10.0 V 0% – 100% = 10.0 - 2.0 V 0% – 1% – 99% – 100% = 0.0 – 5.0 – 7.5 – 10.0 V 0% – 1% – 99% – 100% = 10.0 – 7.5 – 5.0 – 0.0 V 0% – 100% = 1.0 - 10.0 V 0% – 0.01% – 100% = 0 – 1.0 – 10.0 V
24~ feed for active sensors	Same as supply voltage

Priva (head office)
Zijlweg 3
2678 LC De Lier
The Netherlands

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