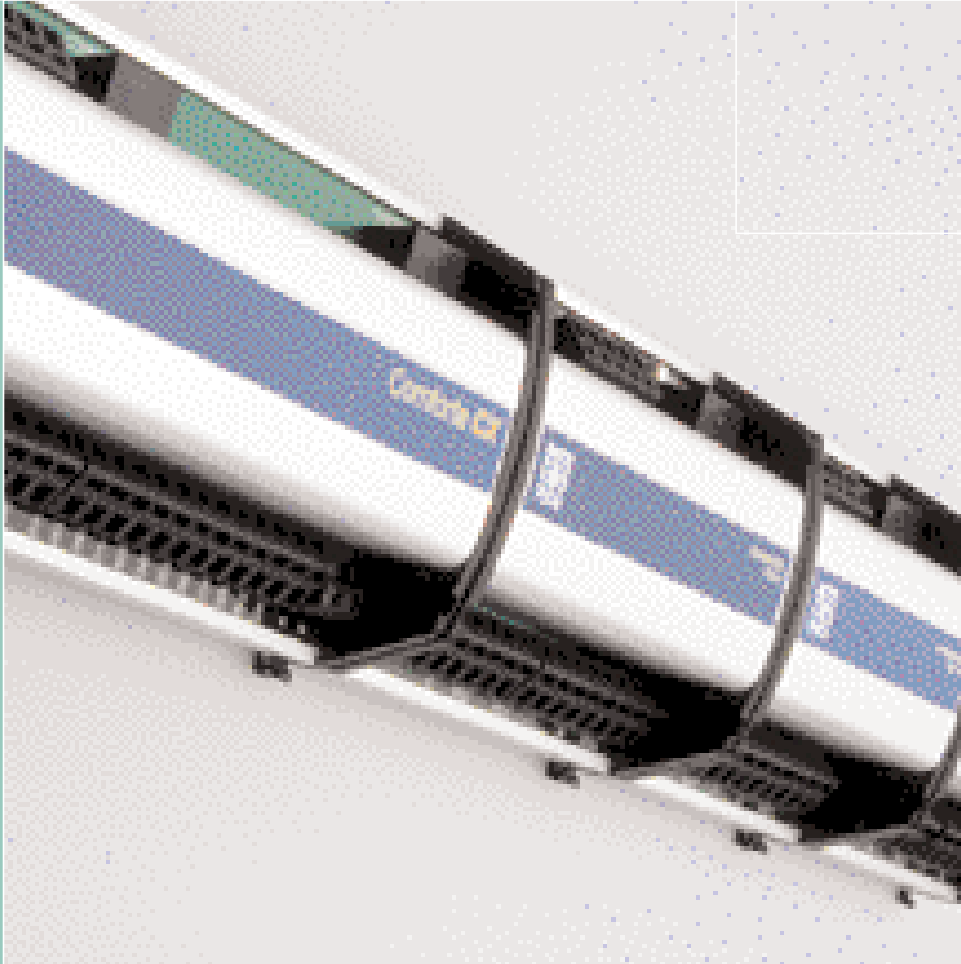
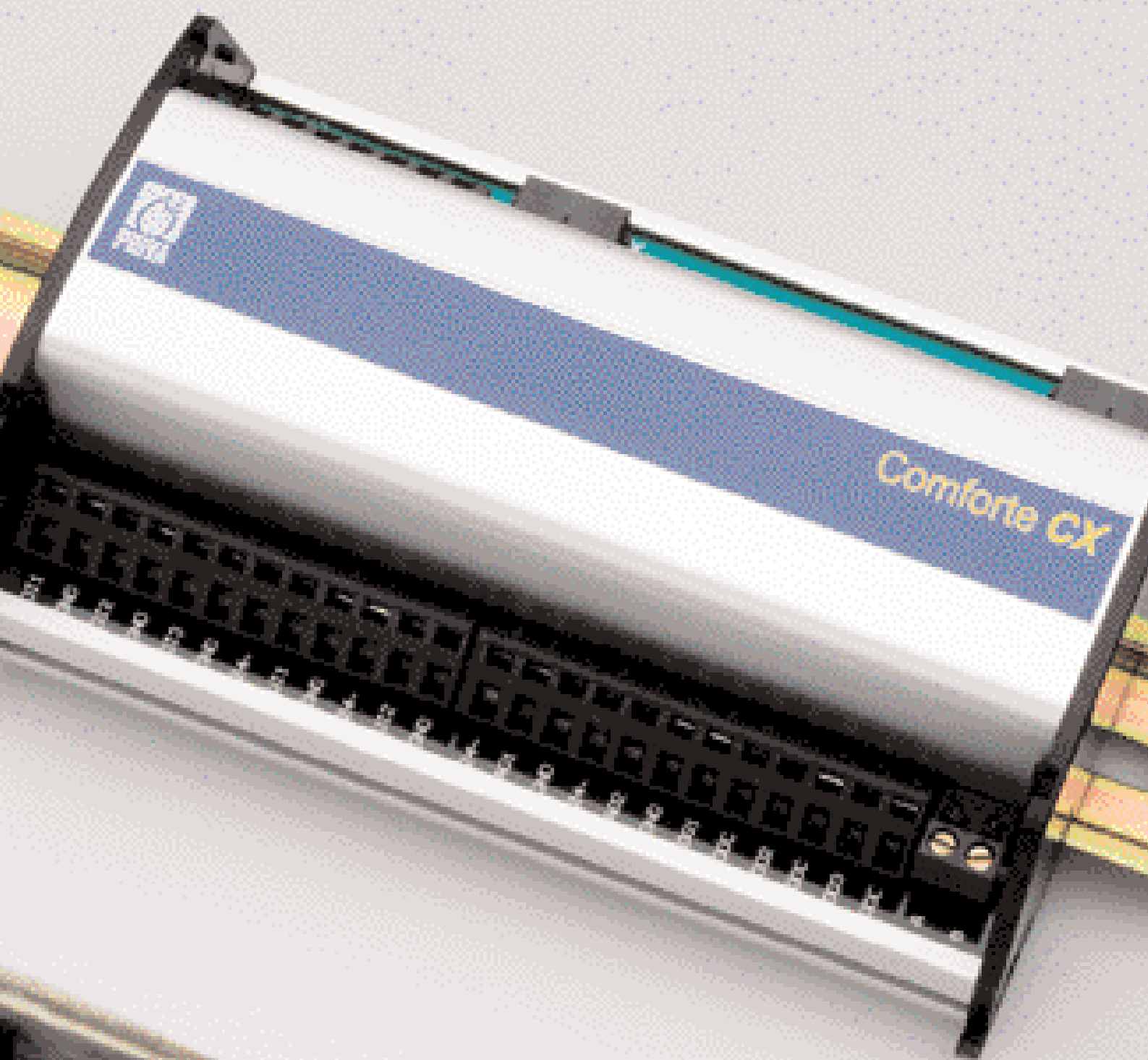


Comforte CX



PRIVA Building Intelligence



Comforte CX

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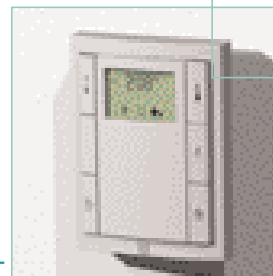
The products illustrated may differ from the products that are supplied.

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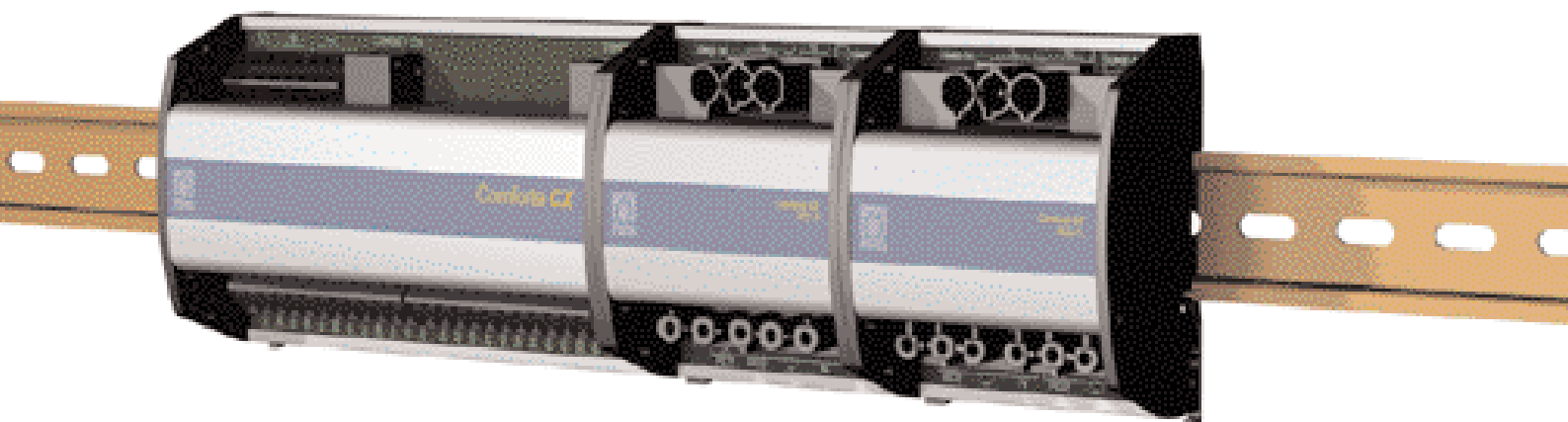
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Comforte CX



Create your own working environment

The Comforte CX is a compact, multi-functional and modular control unit that has been designed specifically for working areas and communal areas in offices, schools, hospitals, hotels and prisons. The system maintains an environment in each individual room that offers maximum comfort for working or other activities.



Modular design

With its modular construction consisting of a base module, supply module and various different output modules, the system is compact and flexible and 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 CX can accommodate a large range of control functions including induction systems, VAV systems, fan-coil systems, ceiling-mounted cooling systems and air-conditioning systems.

Integrated climate control, lighting and sun protection

In addition to heating, cooling and ventilation, the Comforte CX is also capable of controlling lighting and sunblind systems. This level of control integration offers greater individual comfort, reduced energy consumption and lower installation costs. An added advantage is that the air-conditioning, lighting and sunblind systems can be controlled from a single operating station: the Comset CX. This enhances user-friendliness, is more attractive in terms of appearance and reduces installation effort and materials.

Flexible floor configuration

With the availability of more flexible building management systems and the increased frequency of reorganisations, floor configurations in buildings are likely to change more and more often in the future. The Comforte CX has been designed with these future challenges in mind and can be modified simply and easily. Because the Comforte CX control units are able to communicate with each other, it is possible to create clusters, so that areas can be (re)classified without the need for physical installation work. This avoids complex and expensive infrastructure changes.

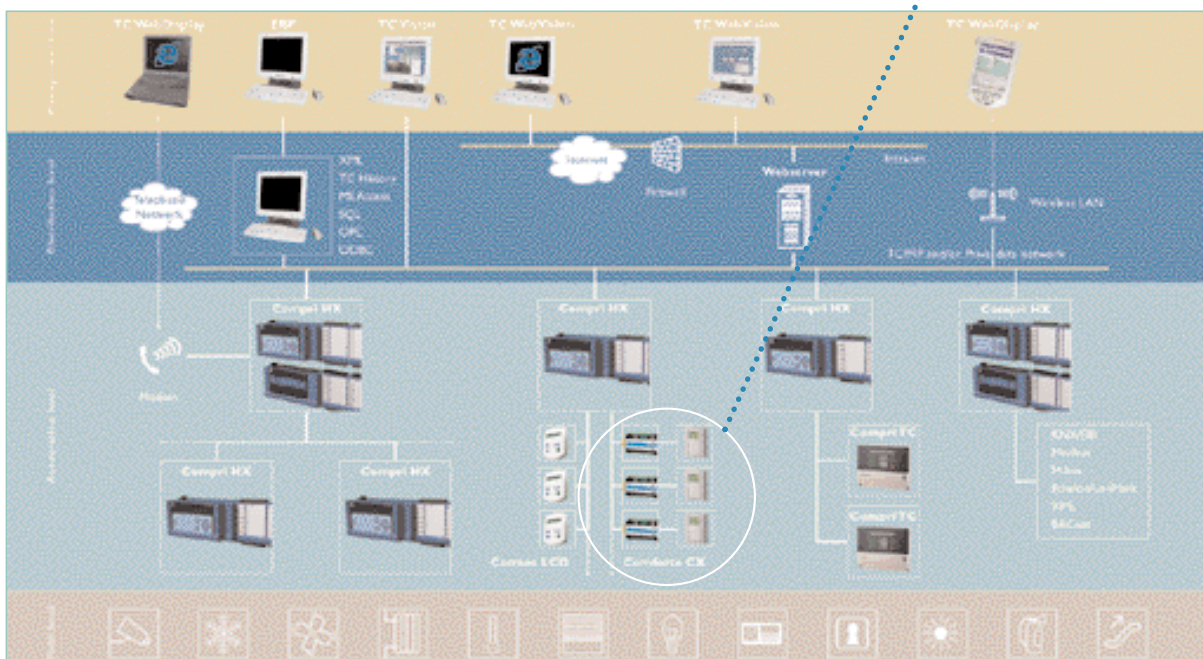
100% Priva Top Control

Priva Top Control is used to program, configure and maintain the control and operating software for the Comforte CX. Top Control is a comprehensive software suite for intelligent building management, which allows applications to react promptly to each other and to signals received from Priva controllers. The entire building can be effectively automated and managed from within an integrated digital environment. Top Control is based on an extensive selection of freely configurable control modules and a powerful and flexible graphical programming environment. Compiling and programming the control instruction 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 lifecycle of the equipment.

Priva Top Control hardware and software offers greater flexibility and security.

Communication

Perfect teamwork between the Compri HX and the Comforte CX in a BACnet environment



The Compri HX, a freely programmable controller, plays a crucial role in communications. The Compri HX not only makes it possible to exchange control data and change settings, it is also used to configure control software and update system software. The Compri HX allows the performance of additional measurements and control routines in the Comforte CX. Control units with communications capability offer many advantages, such as reduced energy costs, because a central broadcast signal prevents unnecessary or extreme control setting changes. Or they can increase comfort by ensuring that room temperatures reach a preset value at a centrally programmed time. The Compri HX also allows long-term storage of settings and readings in the Comforte CX using TC History.

Native BACnet

The Comforte CX is a native BACnet Application Specific Controller (B-ASC) and communicates with other Comforte CX control stations and the Compri HX controller via the BACnet CX network using BACnet MS/TP (Master-Slave/Token-Passing). BACnet is an acronym for Building Automation Control network and defines a protocol for the exchange of data between systems and devices in a building. BACnet is open, multi-brand compatible and can be implemented without restrictions. There is no specific hardware requirement. The PICS (Protocol Implementation Conformance Statement) includes a description of the objects and services that are supported by the Comforte CX (on demand). Priva Top Control performs all configuration and address allocation tasks for the BACnet CX network.

Support of Internet and protocols

Partly due to the intelligent combination with the Compri HX controller, the Comforte CX offers excellent upgradeability to meet future demands. The Compri HX makes internet /intranet applications and cordless communication possible. XML, BACnet, KNX/EIB, Echelon/LonMark, M-bus, Modbus and OPC for example, can also be supported via the Compri HX.

Operation

The Comforte CX offers a variety of options for viewing and modifying settings and statuses:



Comset CX

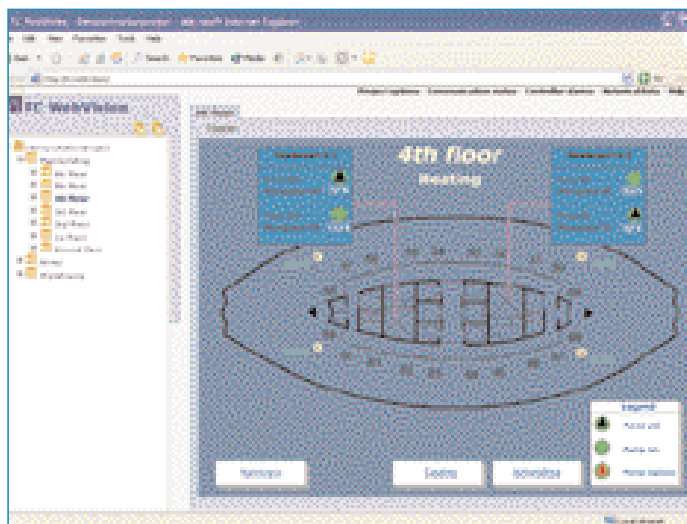
The attractively designed Comset CX is the user-friendly room control unit for the Comforte CX. The uncluttered LCD display and robust and clearly marked keys make operation simple and easy. Each function has its own dedicated key and the display indicates the desired or measured value. Refer to the section entitled 'Comset CX' for a detailed description.

TC Remote

A low-feature operating program, Priva TC Remote, can also be used to operate the Comforte CX via PCs in the areas concerned. This operating program allows settings windows to be set up individually for each workplace.

TC WebVision and TC Vision

TC WebVision and TC Vision are full-feature operating programs for the complete system, and allow a building supervisor or technical services department to view and change all settings. TC WebVision is a webserver application, which allows operation of the Priva building management system using a browser and includes graphs and schematics (see illustration). TC Vision is a PC application that makes it possible to visualise and operate the Priva building management system.



Standard switchgear

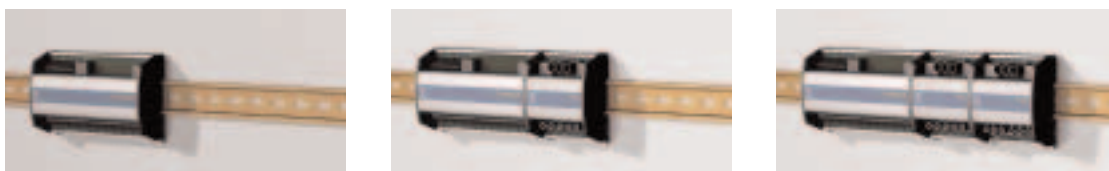
If required, standard switchgear can be used to switch the Comforte CX. A light switch for example. The switchgear needs only be connected to the digital and universal inputs of the Comforte CX. Refer also to the section entitled 'Software'.

Control software in the Compri HX

Operational tasks can be automated and centralised using the control software in the Compri HX, leading to maximum system efficiency. For example, all the lights in a building can be turned off automatically by a central signal after working hours, or a central light level reading can be used to control the sunblind system.

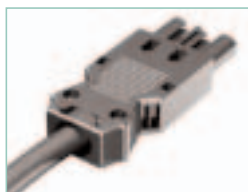
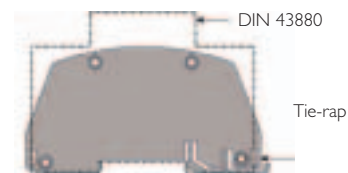
System composition

The Comforte CX 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 power supply module clicks on in the same way and also provides power for the thermoelectric drives for shut-off valves and for active sensors.



Faster installation and reduced wiring

The Comforte CX is suitable for mounting on a DIN rail or on a back plate. All modules are dimensioned to DIN 43880 and are a whole number of standard units of measure width. The electronics are housed in a dust-proof, enclosed case. All connectors are freely accessible. The case features integral eyes that can be useful when fastening cable trusses in place using tie-wraps.



Comforte CX modules are available with GST I8 connectors for low-voltage power supplies and control components. They can be installed quickly and prefabricated. These features make installing the Comforte CX in the area above the suspended ceiling a fast and convenient process. Moreover, as GST I8 connectors are common to almost all electrical systems, a wide range of preassembled installation materials can be used. The intrinsic safety of the GST I8 connector design obviates the need for an additional

housing in most cases. At the same time, the GST I8 connector acts as a safety switch and strain relief device, meaning that savings can be made in installation time and components. All Comforte CX modules can also be supplied with spring terminals for specific applications.

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 Comforte CX I/O module has its own dedicated 3 pin plug connection for the 230 Vac power supply. This means that the outputs of different Comforte CX modules can be fed via separate electrical groups.

Comforte CX modules	
Base module Comforte CX	Module with processor, memory, communication and I/O on the main circuit board.
Power supply module PS230-30	Module that provides the 24 Vac supply to the base module, I/O modules and any active sensors and actuators.
Fan speed module RO1-3	I/O module with relay for fan control (on/off, 2 or 3 speed).
Lighting module RO2-1L	I/O module with relay for switching 2 lighting groups on and off.
Sunblind module RO2-2	I/O module with relay for switching 2 sunblind motors.
Triac output module SO4-1	I/O-module with 4 triac outputs.

Abbreviations used in names	
AO	Analogue output
CX	Compact eXpandable
DI	Digital input
GST I8	Wieland
PS	Power supply
RO	Relay output
SC	Spring Clamp
SO	Solid-state output (triac)
UI	Universal input

Specifications

Housing	
Housing material	Aluminium with plastic end plates
Housing colour	Aluminium with grey-black (RAL 7021) end plates
Housing shape	To DIN 43880
Insulation class	I (basic insulation with earth lead)
Protective rating	IP20
Fire resistance	HB
Recycle code	7
CE mark	Low Voltage Directive 73/23/EEC EMC Directive 89/336/EEC

Installation	
Installation type	Click-on DIN rail system Installation to a back plate using 4 x M5 bolts (maximum thread depth: 5.5 mm)
Where installed	In an enclosed electrical cabinet, distribution box, above a suspended ceiling or in areas accessible to the public.

Environmental requirements	
Permissible ambient operating temperature	0 to 50°C
Permissible transportation/storage temperature	-20 to 70°C
Permissible maximum ambient relative humidity	80% at T ≤ 30°C, linear degression to 50% at T = 40°C (non-condensing)
Installation class	Installation category (overvoltage category) II
Permissible ambient pollution	Pollution degree 2

I/O connections	
Type of connector (module dependent)	Spring terminals or plug-in GST18 connector

Spring terminals	
Permissible cable cross section for use with spring terminals	0.5 to 2.5 mm ² (single core or multi-core) 0.25 to 1.5 mm ² (multi-core with ferrule connector to DIN 46228/1)

Communication	
Protocol	BACnet MS/TP
Network designation	BACnet CX network
Driver required (per Compri HX port)	Compri Comforte CX data network/BACnet driver
Part number	510348
Interface type	RS485
Interface speed	38k4 bps
Maximum no. of Comforte CX control units per Compri HX 3	0
Maximum no. of Comforte CX control units per Compri HX 4	75
Maximum no. of Comforte CX control units per Compri HX 8E	75

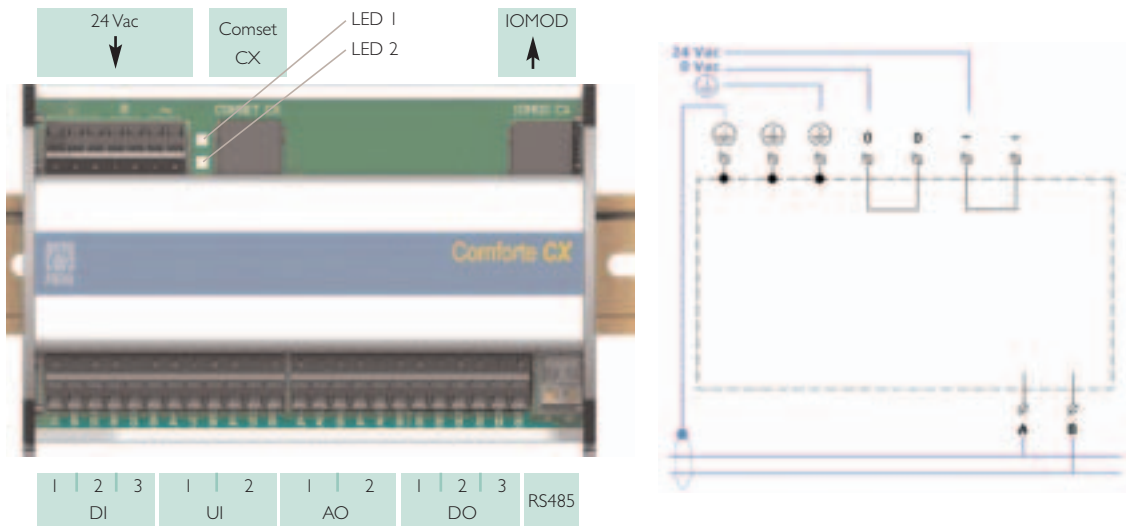
Communication cable				
Permissible network topology	Bus network		Star network*	
Type of cable required	Twisted pair	CAT5E	Twisted pair	CAT5E
Maximum cable length between the 2 outermost Comforte CX control units	-	-	250 m	500 m
Maximum total cable length	400 m	1000 m	500 m	900 m
Maximum cable capacitance	100 pF/m	-	100 pF/m	-
Minimum cross section	0.2 mm ²	-	0.2 mm ²	-
Bus terminator	None	None	None	None
No. of cores used	2: the installation satisfies the requirements of EN 61000-6-1 3 (the Comforte CX is connected to the electrical earth via the communication cable); the installation satisfies the requirements of EN 61000-6-2 (industrial standard)			

Reaction time	
Reaction time - Comset CX to Comforte CX	On average within 0.3 seconds
Reaction time - Comforte CX to another Comforte CX in the same BACnet CX network	On average within 0.7 seconds**
Reaction time - Comforte CX to Compri HX	On average within 0.5 seconds**
Reaction time - Compri HX to Comforte CX	On average within 0.5 seconds**

* A ring network may also be possible with these specifications

**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 Compri HX depends on current capacity usage by, for example, the software, serial communication, etc. This reaction time can be determined by practical tests.

Base module Comforte CX



General	
Component	Base module Comforte CX
Part number	400022
Dimensions	144 x 90 x 49 (wxhxd in mm) (8TE)
Weight	330 grammes
Indicator lights	Green LED indicates correct module function (LED1). Red LED indicates power supply connection problem (LED2).

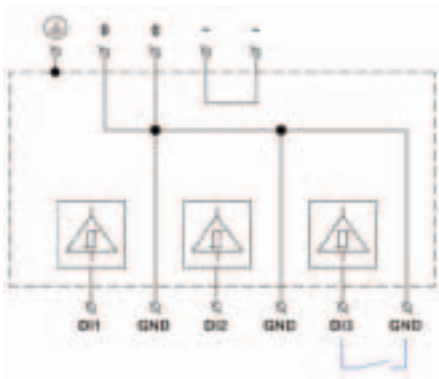
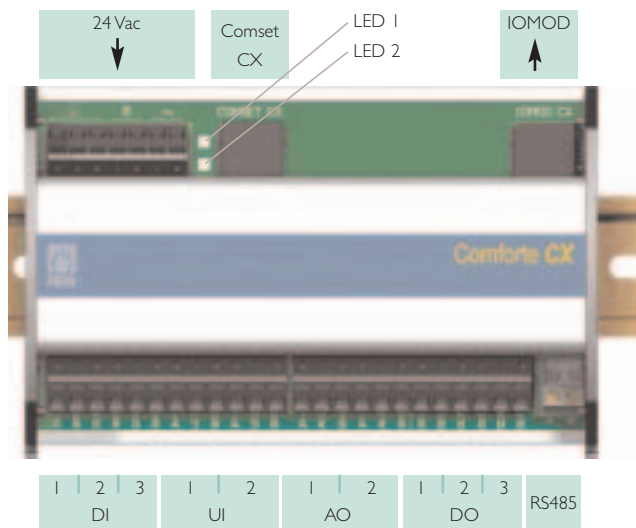
Power supply													
Supply voltage	24 Vac $\pm 25\%$												
Required mains frequency	50 Hz / 60 Hz												
Type of connector for power supply	5 pin spring terminals (double supply terminals allowing the use of jumpers)												
Earth wire cross section	2.5 mm ²												
Maximum fuse value for external fuses (applies if the Comforte CX power supply module is not used)	3.15 A slow-blow (in accordance with EN 60127-2 sheet III)												
Maximum power consumption - base module*	4.5 W (8 VA)												
Maximum power consumption - base module including Comset CX and 4 I/O modules*	10 W (17 VA)												
Maximum supply current draw at 24 Vac*	<table> <tr> <td>Base module Comforte CX:</td><td>333 mA</td></tr> <tr> <td>Comset CX:</td><td>27 mA</td></tr> <tr> <td>Fan module RO1-3:</td><td>81 mA</td></tr> <tr> <td>Lighting module RO2-1L:</td><td>63 mA</td></tr> <tr> <td>Sunblind module RO2-2:</td><td>98 mA</td></tr> <tr> <td>Triac output module SO4-1:</td><td>71 mA</td></tr> </table>	Base module Comforte CX:	333 mA	Comset CX:	27 mA	Fan module RO1-3:	81 mA	Lighting module RO2-1L:	63 mA	Sunblind module RO2-2:	98 mA	Triac output module SO4-1:	71 mA
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Lighting module RO2-1L:	63 mA												
Sunblind module RO2-2:	98 mA												
Triac output module SO4-1:	71 mA												

* Excluding the load on the DO and 24~ terminals

Communication with Comforte CX modules	
Maximum no. of I/O modules per base module	Total: 4 Fan module RO1-3: 1 Lighting module RO2-1L: 2 Sunblind module RO2-2: 2 Triac output module SO4-1: 1
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)

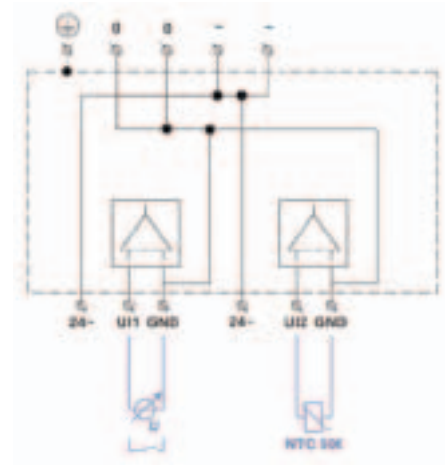
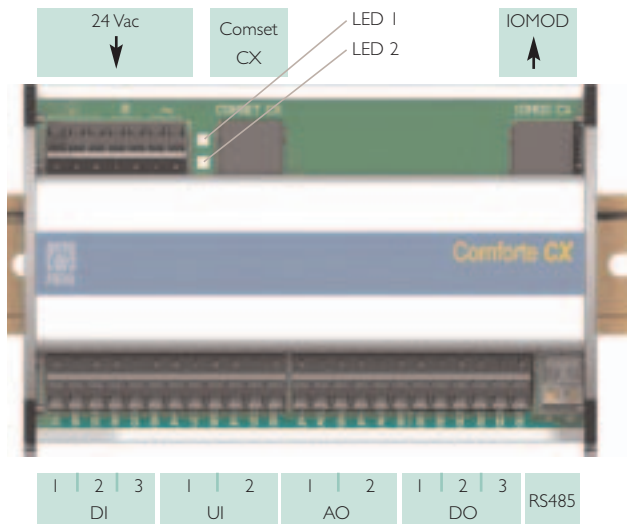
Communication with the room control unit	
Maximum no. of Comset CX room control units	1
Type of connector	RJ45 8-8 or RJ45 8-6
Cable type	Unshielded with 6 or 8 cores (e.g. UTP Ethernet cable)
Maximum cable length	25 m

Base module Comforte CX



Digital inputs	
Number	3
Type of connector	Spring terminals
Application	Voltage-free contact to GND
Configuration option	The digital inputs can be inverted using TC Select (software setting)
Minimum open contact resistance	20 k Ω
Maximum closed contact resistance	5 k Ω
Nominal sampling time	8 ms
Overload safety	± 50 V

Base module Comforte CX



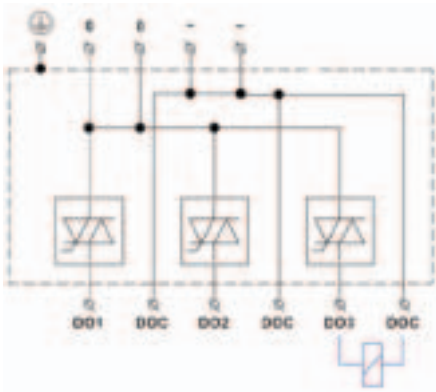
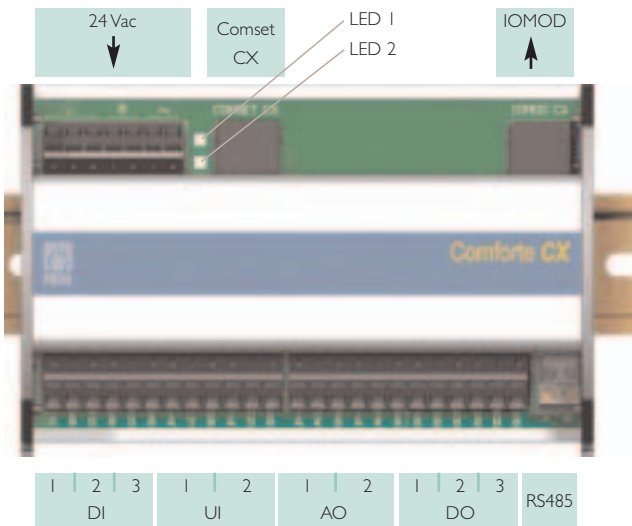
Universal analogue inputs

Number of universal inputs	Maximum 2, per input choice of analogue or digital
Type of connector	Spring terminals
Configurable for measurements via	Voltage via a self-defined characteristic Priva temperature sensor 50k Priva temperature sensor 3k Siemens LG-NII000 temperature sensor Thermokon TK5000 NII000 temperature sensor DIN 43760 NII000 temperature sensor Linear potentiometers for temperature adjustment (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 _{in} - 5)/5 mA
Measurement range	0 to 10 Vdc
Resolution	250 µV
Voltage measurement accuracy (0 to 5 V)	± (2 mV + 0.5% of the reading)
Voltage measurement accuracy (5 to 10 V)	± (2 mV + 0.6% of the reading)
Resistance measurement accuracy (0 to 5 V)	± 2 mV
Maximum input voltage overload	-50..+50 V
24~ supply for active sensors	Same as supply voltage

Universal inputs for digital use

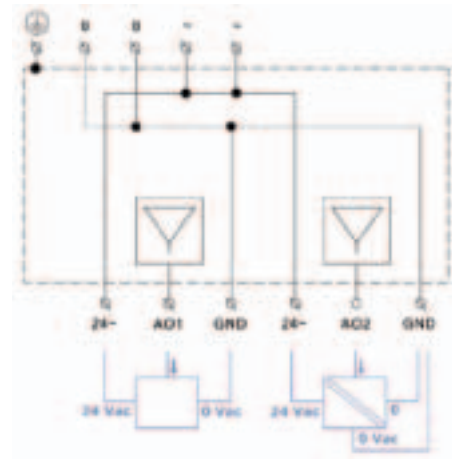
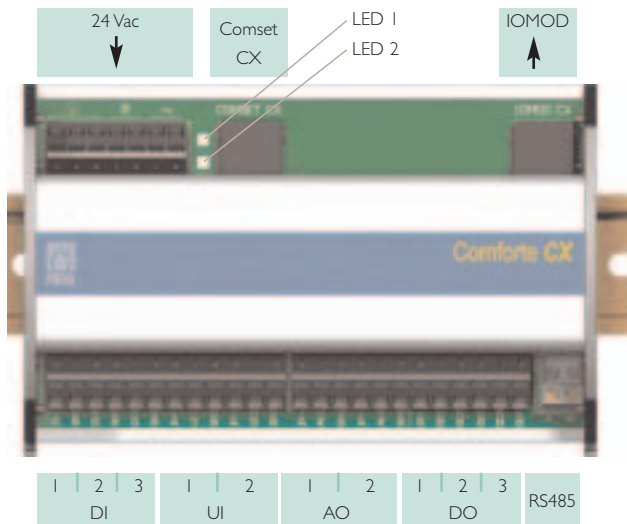
Number of universal inputs	Maximum 2, per input choice of analogue or digital
Type of connector	Spring terminals
Application	Voltage-free contact to GND
Use as pulse counter	No
Configuration option	The digital inputs can be inverted using TC Select (software setting)
Minimum open contact resistance	20 kΩ
Maximum closed contact resistance	5 kΩ
Maximum sample time	300 ms

Base module Comforte CX



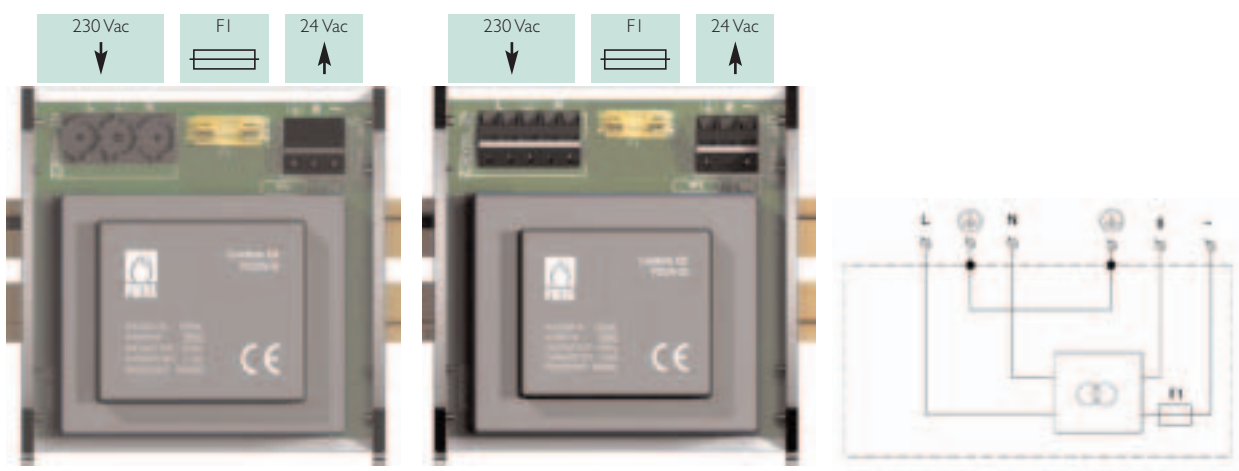
Digital outputs	
Number	3
Type of connector	Spring terminals
Type of output	Triac
Configuration option	The digital outputs can be inverted using TC Select (software setting)
Switching voltage on terminal DOC	Same as supply voltage
Maximum current load per output (continuous)	0.5 A
Maximum current load per output (during 2 minutes)	0.8 A
Overload safety	In the event of an overload, the outputs are switched off and disabled. They can be re-enabled using TC Select.
Maximum current overload safety (per 3 outputs)	2.5 to 4 A

Base module Comforte CX



Analogue outputs	
Number	2
Type of connector	Spring terminals
Control range	0 - 10 Vdc
Maximum current load per output	4 mA
Minimum load impedance	2.5 k Ω
Resolution	1 mV
Accuracy	$\pm$ (20 mV + 0.5% of the control signal)
Safeties	Protection against short-circuit to GND Protection against connection to voltages up to 30 Vac
Output characteristics	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~ supply for active sensors	Same as supply voltage

Power supply module PS230-30



General		
Component	Power supply module 230/24Vac 30VA Comforte CX PS230-30 GST18	Power supply module 230/24Vac 30VA Comforte CX PS230-30 SC
Part number	400044	400054
Dimensions	90 x 90 x 72 (wxhxd in mm) (5TE)	
Weight	960 grammes	

Supply input		
Type of connector	3 pin GST18 connector (male)	5 pin spring terminals
Voltage	230 Vac (196 to 253 Vac)	
Required mains frequency	50 Hz / 60 Hz	
Required system fuse rating	Maximum 16 A	
Primary fuse	Not required (the transformer is fitted with a self-resetting thermal fuse)	

Transformer	
Output capacity	30 VA
Norm	EN 61558

Supply output	
Type of connector	3 pin spring terminals
Nominal voltage	24 Vac
Maximum current load	1.25 A
Safeties	Glass fuse 1.25 A slow-blow

Calculation of the number of sensors and thermoelectric actuators that can be connected

If the power supply module, in addition to supplying power to the base module, Comset CX and I/O modules, is also to be used to provide the supply to thermoelectric actuators on shut-off valves and to active sensors, it is necessary to calculate whether the PS230-30 power supply module has adequate capacity.

Note! This calculation only takes into account the capacity of the PS230-30 power supply module; you must check the maximum load capacity of the triac and analogue outputs yourself.

Calculation method

Step 1 Calculate the maximum power consumption by adding up the maximum power consumption of the Comforte CX, Comset CX and I/O-modules that are to be connected.

Module	Maximum supply current draw [mA]
Base module Comforte CX	333
Comset CX	27
Fan speed module RO1-3	81
Lighting module RO2-1L	63
Sunblind module RO2-2	98
Triac output module SO4-1	71

Step 2 Determine which thermoelectric actuators are to be included in the calculation:

- In the case of thermoelectric actuators connected to analogue outputs, allow for all thermoelectric actuators.
- In the case of thermoelectric actuators connected to digital outputs, only allow for the actuators that are switched simultaneously (e.g. the thermoelectric actuators for the cooling or heating systems only).

Step 3A For Belparts AA501 I, AA603 I, AA400 I and AA402 I thermoelectric actuators:

The table below shows the maximum number of thermoelectric actuators for shut-off actuators against the maximum power consumption value. It may be necessary to interpolate between the two columns. Round the number of thermoelectric actuators for shut-off actuators down.

Step 3B For other types of thermoelectric actuators or active sensors (this method is less accurate and results in a lower maximum number of thermoelectric actuators):

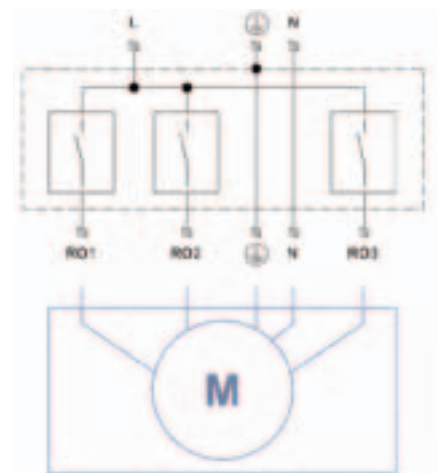
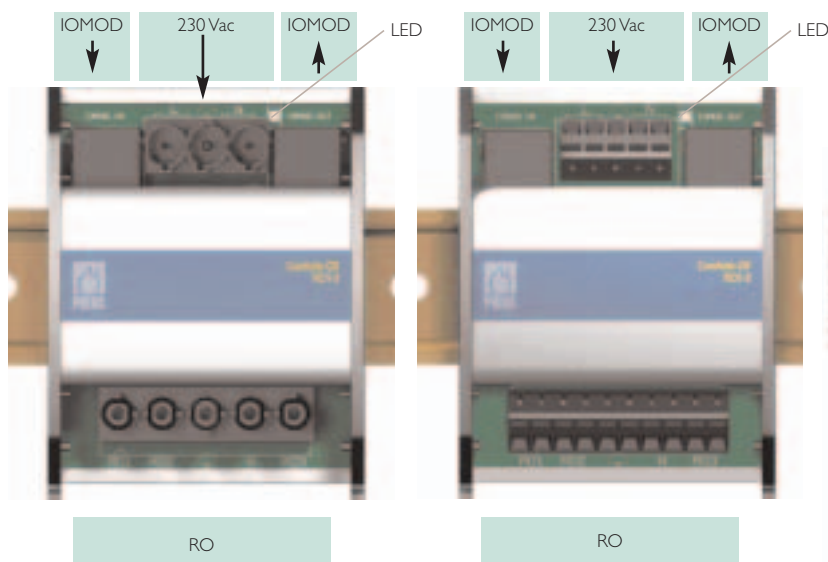
The table below shows the 'Maximum continuous current connection value' against the maximum current draw. Interpolate if necessary. Ensure that the actual continuous current connection value is lower than the 'Maximum continuous current connection value'. The table below shows the 'Maximum peak current connection value' against the maximum current draw. Interpolate if necessary. Ensure that the actual peak current connection value is lower than the 'Maximum peak current connection value'.

Maximum current draw of the Comforte CX with I/O modules and	708	629	595	562	523	467	422	388	333
Maximum no of thermoelectric actuators rated at 63 mA (continuous) 250 mA (peak)*	5,7	6,9	7,6	8,2	8,9	9,9	10,9	11,6	13,1
Maximum no of thermoelectric actuators rated at 70 mA (continuous) 200 mA (peak)**	6,9	8,3	9,1	9,8	10,7	11,7	12,4	12,9	13,6
Maximum continuous current connection value [A]	0,6	0,66	0,69	0,73	0,76	0,82	0,87	0,9	0,95
Maximum peak current connection value [A]	1,1	1,3	1,4	1,5	1,6	1,75	1,9	2	2,2

* For example, Belparts AA501 I and AA603 I

**For example, Belparts AA400 I and AA402 I

Fan speed module RO1-3

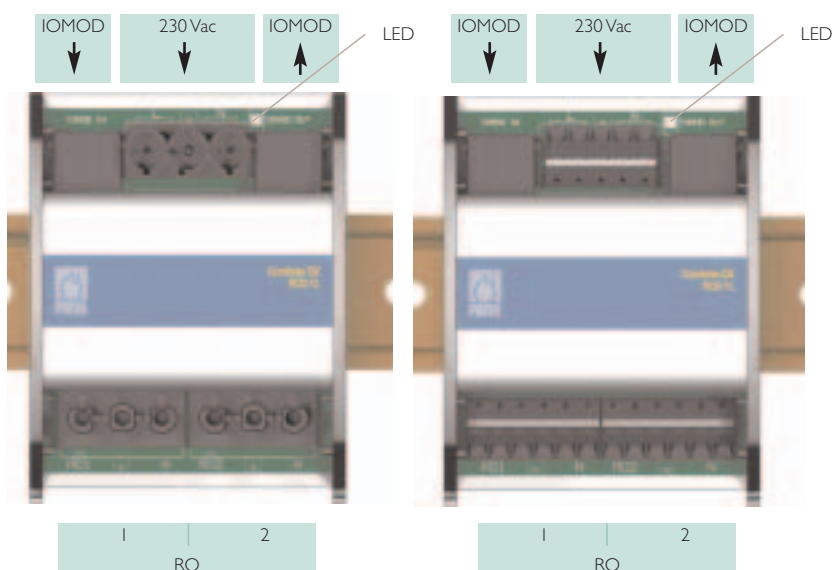


General		
Component	Relay output module 1x fan speed Comforte CX RO1-3 GST18	Relay output module 1x fan speed Comforte CX RO1-3 SC
Part number	400043	400053
Dimensions	72 x 90 x 49 (wxhxd in mm) (4TE)	
Weight	205 grammes	
Indicator lights	Green LED indicates correct module function.	

Input		
Type of connector	3 pin GST18 connector (male)	5 pin spring terminals
Maximum voltage	260 Vac	
Required system fuse rating	Maximum 16 A	

Outputs		
Number	3 (for 1, 2 or 3 speed fan)	
Type of connector	5 pin GST18 connector (female)	10 pin spring terminals
Type of output	Current-carrying relay contact (NO)	
Output voltage	Same as input voltage	
Maximum current load per relay	8 A ($\cos \varphi > 0.5$, with a purely inductive load) 500 W (1-phase motor load)	
Required minimum current load per relay	30 mA	
Expected relay lifecycle	Mechanical: 10 ⁶ Electrical: 10 ⁵	
Dielectric strength (contact ↔ remainder of the circuit)	> 2300 Vac	
Required external fuse	None	

Lighting module RO2-IL



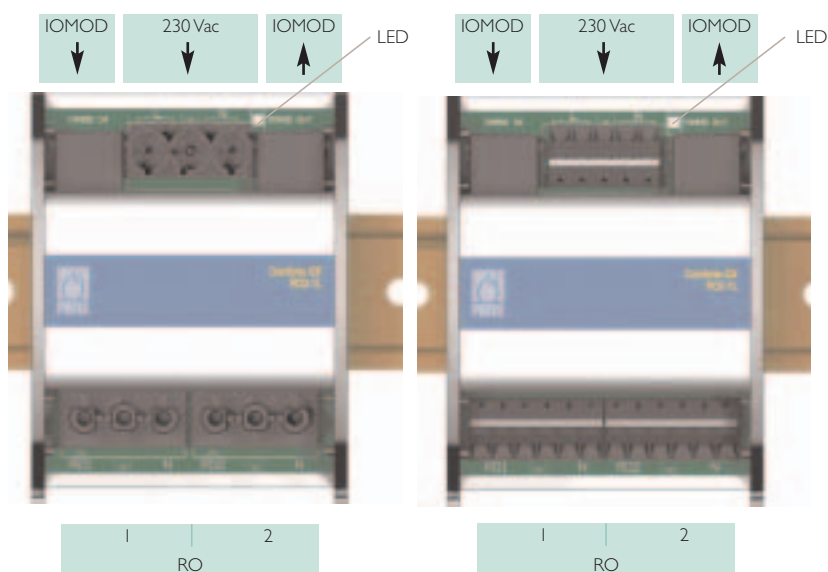
General		
Component	Relay output module 2x lighting Comforte CX RO2-IL GST18	Relay output module 2x lighting Comforte CX RO2-IL SC
Part number	400041	400051
Dimensions	72 x 90 x 49 (wxhxd in mm) (4TE)	
Weight	190 grammes	
Indicator lights	Green LED indicates correct module function.	

Input		
Type of connector	3 pin GST18 connector (male)	5 pin spring terminals
Maximum voltage	260 Vac	
Required system fuse	Maximum 16 A	

Outputs		
Number	2 (for 2 lighting groups)	
Type of connector	2 x 3 pin GST18 connectors (female)	2 x 6 pin spring terminals
Type of output	Current-carrying relay contact (NO)	
Output voltage	Same as input voltage	
Maximum current load per relay	8 A ($\cos \varphi > 0.5$, with a purely inductive load) Incandescent filament bulbs: 1000 W Halogen lamps: 1000 W	
Maximum switching current per output	120 A during 20 ms*	
Required minimum current load per relay	30 mA	
Expected relay lifecycle	Mechanical: 10 ⁶ Electrical: 10 ⁵	
Dielectric strength (contact ↔ remainder of the circuit)	> 2300 Vac	
Required external fuse	None	

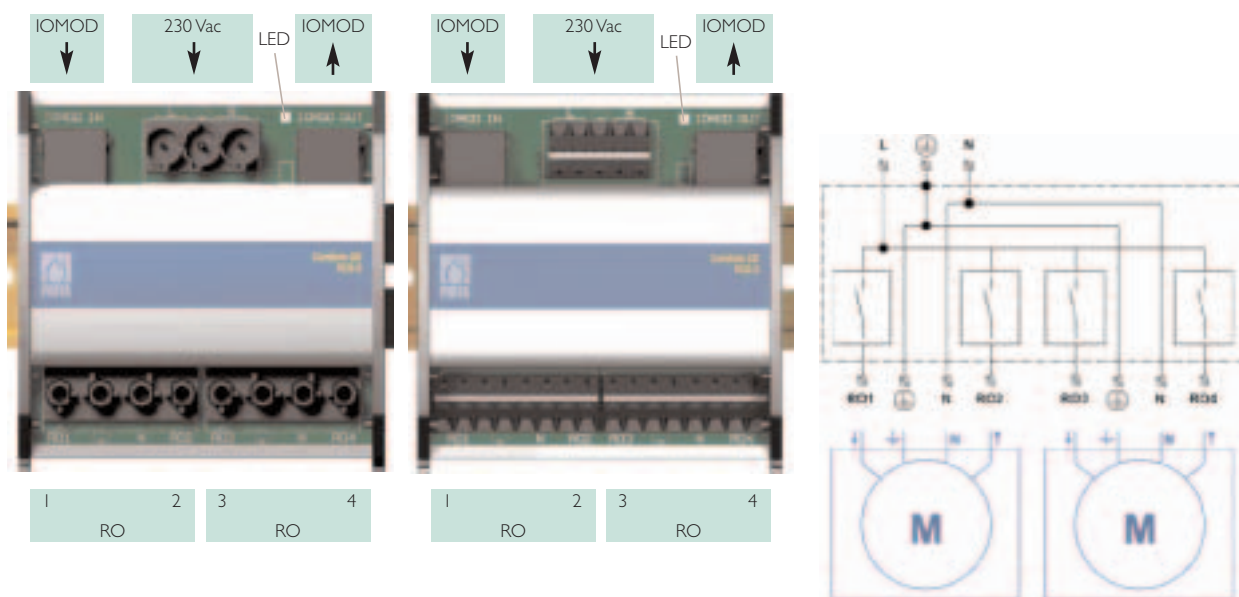
* Use the switching current values of the light fittings that are to be connected to determine whether the output is capable of switching the fittings. If the switching current is unknown, the table below gives an indication of the number of light fittings that can be connected.

Lighting module RO2-IL



Maximum number of fluorescent light fittings per output			
Type of fitting	With electromagnetic ballast, no compensation	With electromagnetic ballast, parallel compensation	With HF electronic ballast
1 x 18 W	8	8	7
2 x 18 W	8	6	6
1 x 36 W	8	6	5
1 x 58 W	6	4	5
2 x 36 W	4	3	5
1 x 70 W	3	2	5
1 x 100 W	3	2	4
2 x 58 W	3	2	4
2 x 70 W	1	1	4
2 x 100 W	1	1	3

Sunblind module RO2-2

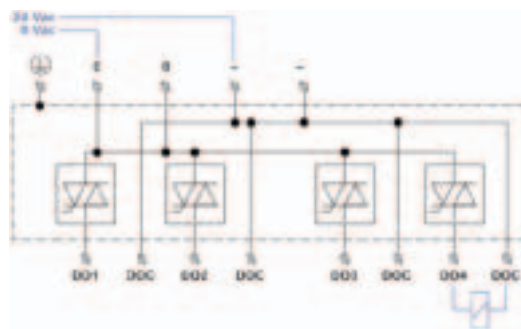
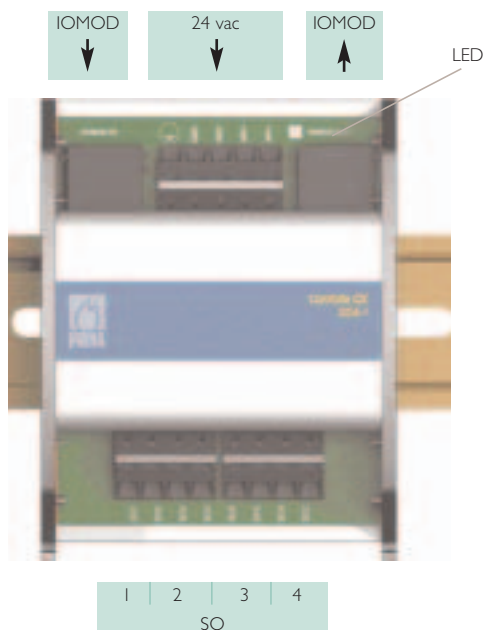


General		
Component	Relay output module 2x sunblind Comforte CX RO2-2 GST18	Relay output module 2x sunblind Comforte CX RO2-2 SC
Part number	400042	400052
Dimensions	90 x 90 x 49 (wxd in mm) (5TE)	
Weight	255 grammes	
Indicator lights	Green LED indicates correct module function.	

Input		
Type of connector	3 pin GST18 connector (male)	5 pin spring terminals
Maximum voltage	260 Vac	
Required system fuse	Maximum 16 A	

Outputs		
Number	4 (for 2 sunblind motors open/close)	
Type of connector	2 x 4 pin GST18 connectors (female)	2 x 8 pin spring terminals
Type of output	Current-carrying relay contact (NO)	
Output voltage	Same as input voltage	
Maximum current load per relay	8 A (cos $\varphi > 0.5$, with a purely inductive load) 500 W (1-phase motor load)	
Required minimum current load per relay	30 mA	
Expected relay lifecycle	Mechanical: 10 ⁶ Electrical: 10 ⁵	
Dielectric strength (contact ↔ remainder of the circuit)	> 2300 Vac	
Required external fuse	None	

Triac output module SO4-I



General	
Component	Triac output module Comforte CX SO4-I
Part number	400060
Dimensions	72 x 90 x 49 (wxhxd in mm) (4TE)
Weight	152 grammes
Indicator lights	Green LED indicates correct module function.

Input	
Voltage	24 Vac $\pm$ 25%
Type of connector	5 pin spring terminals

Outputs	
Number	4
Type of connector	8 pin spring terminals
Type of output	Triac
Switching voltage on terminal DOC	Same as supply voltage
Maximum current per output (continuous)	0.5 A
Maximum current load per output (during 2 minutes)	0.8 A
Safeties	In the event of an overload, all outputs are switched off and disabled. They can be re-enabled using TC Select.
Maximum current overload safety (per 4 outputs)	3.5 to 5 AA

Comset CX



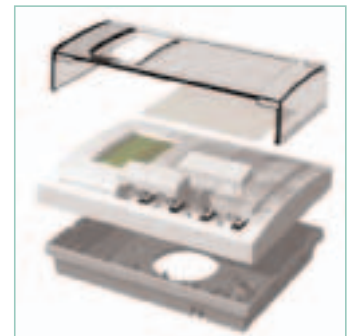
The Comset CX is the room control unit for operating the Comforte CX, complete with LCD screen, keys and temperature sensor. The Comset CX's flexible key layout makes it possible to configure the unit to the needs of individual users and room characteristics. The LCD screen displays the desired setting when the unit is operated, at all other times the screen displays the time, outside temperature, room temperature or is blank.

Construction

The Comset CX is made up of a number of parts. The Comset CX base can be fixed to the wall or mounted in a flush-fit box. The front panel of the Comset CX simply clicks onto the base.

A built-in temperature sensor measures room temperature. Clever housing design prevents problems with damp penetrating from the standard flush-fit box. The measurement is processed in the Comset CX and the value is then passed to the Comforte CX.

A transparent text card cover (optional) is available, which can be used to describe project-dependent key functions.



Keys

The operating keys, which are identified by easily legible icons, can be configured with a high degree of flexibility. This makes it possible to configure the correct function mode for all applications, even if the room's function changes at a later date. Unused, unidentified keys are disabled.

There is a special scene key for presentation theatres, which adjusts a number of settings with a single key press. TC Select can be used to define which settings are affected by the scene key, such as occupancy settings, lighting and sunblind settings. The desired values for each scene can be set in TC WebVision/TC Vision.

In addition to the settings keys, there is a review key, which can call up a series of readings such as measured room temperature and outside temperature.

The table below describes key availability.

Icon legend								
Occupancy	Overtime	Room temperature	Ventilation	Lighting	Dimmer	Scene control	Sunblind	Review

Standard configurations

The Comset CX is available in a number of configurations.



	Comset CX		Comset CX Fanspeed unit		Comset CX Hotel	
Component	Comset CX (off-white)	Comset CX (silver)	Comset CX Fancoilunit (off-white)	Comset CX Fancoilunit (silver)	Comset CX Hotel (off-white)	Comset CX Hotel (silver)
Part number	400110	400120	400111	400121	400112	400122
Application	Offices		Offices with ventilation adjustment		Temperature and ventilation adjustment	
Extra keys (left or right)	[		[			
Extra left-side keys	[		[			
Extra right-side keys	[					



	Comset CX Universal		Comset CX Universal with function selection	
Component	Comset CX Universal (off-white)	Comset CX Universal (silver)	Comset CX Universal with function selection (off-white)	Comset CX Universal with function selection (silver)
Part number	400113	400123	400114	400124
Application	Applications with several lighting and sunblind groups.		Applications with several lighting and sunblind groups.	
Keys (left or right)	[		[	
Left-side keys	[		[	
Right-side keys	[		[	
Working principal	There is one 'Up' key or 'Down' key for each setting.		In order to change a setting, the setting must first be selected using the appropriate key, followed by the 'Up' or 'Down' key to change the settings. For on/off actions the function key works as an on/off switch without the need to operate the 'Up' and 'Down' keys.	

Specifications

General	
Dimensions without text card cover	92 x 120 x 36 (wxhxd in mm)
Dimensions with text card cover	92 x 125 x 36 (wxhxd in mm)
Weight without text card cover	106 grammes

Housing	
Construction	Base with ventilation openings for temperature measurement Front panel Keys Text card cover (optional)
Cable entry	Opening in base Snap-out moulded apertures in base (bottom/top)
Installation type	Wall mounting or mounting in standard flush-fit box
Material base/front panel	ABS
Front panel colour	Off-white, similar to RAL 9010 (type Off-white) Metallic, similar to RAL9006 (type Silver)
Base colour	Light grey, similar to RAL7044 (type Off-white) Grey, similar to RAL7024 (type Silver)
Protective rating	IP40
Fire resistance	V0
Recycle code	7

Environmental requirements	
Permissible ambient operating temperature	0 to 50°C
Permissible transportation/storage temperature	-20 to 70°C
Permissible maximum ambient relative humidity	80% at T ≤ 30°C, linear degression to 50% at T = 40°C (non-condensing)
Installation class	Installation category (overvoltage category) II
Permissible ambient pollution	Pollution degree 2

Display	
Type of display	LCD with digits and symbols
Dimensions without text card cover	41.6 x 26.6 (hxd in mm)
Dimensions with text card cover	40 x 25 (hxd in mm)

Operation	
Means of operation	Keys
Maximum number of keys	12 (depending on model)

Communication with Comforte CX	
Type of connector	RJ45 8-8 or RJ45 8-6
Cable type	Unshielded with 6 or 8 cores (e.g. UTP Ethernet cable)
Maximum cable length	25 m

Temperature measurement	
Measurement range	0 to 50°C
Accuracy (in combination with Comforte CX)	Between 0 and 5°C: ±0.45°C Between 5 and 35°C: ±0.30°C Between 35 and 50°C: ±0.45°C

Text card cover	
Component	Comset CX Transparent text card cover
Part number	400100
Material text card cover	Styrene acrylonitrile copolymer
Text card cover colour	Transparent
Text card dimensions	62 x 41 (hxd in mm)
Weight	18 grammes

Comforte CX Software

Introduction

Engineering

Comforte CX engineering and set-up takes place entirely in TC Select, Priva Top Control's engineering program. The control settings are tailored to the desired situation using the configuration facility and are delivered complete with a schematic and documentation for operation via a PC. TC Select indicates whether or not the desired functionality can be achieved with the Comforte CX. Because TC Select allows simple and easy copying of selected configurations and settings, the engineering set-up of the Comforte CX takes very little time.

Commissioning

The Comforte CX is commissioned using TC Select. The required control software is transferred to the control unit via a Compri HX controller. The system software, control software and settings are stored in flash memory to avoid their loss in the event of a power failure. During commissioning, diagnostic readings provide extra information about the internal function of the Comforte CX. The control software can be updated via the Compri HX. In addition, the system software (firmware) can also be upgraded, so that the system can be altered to suit future developments.

What is the difference between configuration and set-up?

The concepts 'configuration' and 'set-up' appear regularly in this product description. To avoid misunderstanding, we have defined them as follows: 'configuration' refers to the choices that are made during the process of engineering the control software (programming), whereas 'set-up' refers to changing values when operating a working system.

System functions

Priva Top Control offers a wide range of control modules for the Comforte CX. Each control module includes all the components that are required for controlling, registering and operating a Priva control system. Configuration is used to tune the control module to suit the global system. A single procedure modifies not only the control strategy, but also the settings windows, process schematics, documentation and I/O allocation. This makes it possible to engineer a comprehensive and consistent building management system with a minimum of time and effort. TC Select allows the installer to make a selection from the various control modules for the Comforte CX:

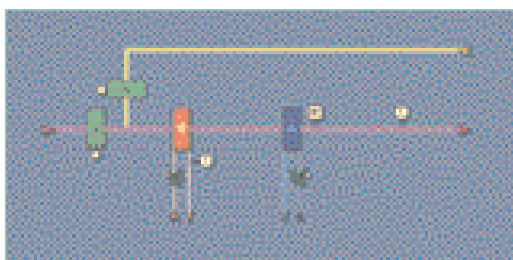
- Induction unit with heater and/or cooler
- Fan-coil unit with heater and/or cooler
- Room heating
- Ceiling-mounted cooling
- Ceiling-mounted cooling with room heating
- Ceiling-mounted air-conditioning
- VAV box system with or without heater

All these control modules are also equipped with controls for lighting and sunblind as standard.

TC Select provides a complete overview of the control modules: on following pages, you will find a global summary of the features of each control module. The types of sensor and controls that can be connected to the inputs and outputs of the Comforte CX are listed for each control module. The required outputs and inputs that are available for all the sensors and controls are also detailed (see page 37, 38).

The section entitled 'Explanatory notes' (page 39) contains additional information on price supplements, logging graphs, messaging, network variables, clustering and definitions.

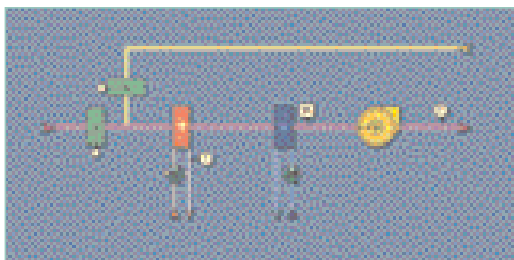
Induction unit with heater and/or cooler



Climate control	
Control value	Choice of: • Room temperature set-point • Supply air temperature set point Set points are dependent on operating modes (see page 40).
Control function	Choice of: • Heating or cooling based on room temperature (see page 40) • Heating or cooling based on supply air temperature (see page 41) Cascade control of room temperature set point against calculated supply air temperature (see page 41) Condensation Protection Ventilation during the night (see page 41) Change-over (2 and 4 pipe systems) (see page 41)
Alarms	Frost setting based on minimum return air temperature control Room temperature alarm limits
Operating inputs (see page 37)	Comset CX Operation through (permanent voltage contact, pulse contact, motion detector or access detector) Potentiometer for desired room temperature setting or offset against room temperature set point
Control inputs (see page 37)	Room temperature Room temperature via Comset CX. Supply air temperature Window contact Condensation thermostat Heating system return air temperature (price supplement, see page 39, 'Additional Comforte CX measurement') Air quality (price supplement, see page 39, 'Additional Comforte CX measurement') Relative humidity (price supplement, see page 39, 'Additional Comforte CX measurement')
Outputs (see page 38)	Cooling valve Heating valve Split range valve (see page 41) Extra change-over heating valve (4 pipe systems) Extra change-over cooling valve (4 pipe systems) Supply air damper (price supplement, see page 39, 'Additional Comforte CX control function')

Other controls	
Lighting	See page 35
Sunblind	See page 36
Compri HX accessible inputs	digital input (price supplement, see page 39, 'Compri HX accessible Comforte CX digital input') analogue input (price supplement, see page 39, 'Compri HX accessible Comforte CX analogue input')
Compri HX accessible outputs	digital output (price supplement, see page 39, 'Compri HX accessible Comforte CX digital output') controller (price supplement, see page 39, 'Compri HX accessible Comforte CX controller')

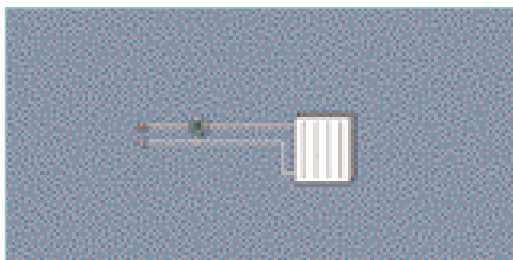
Fan-coil unit with heater and/or cooler



Climate control	
Control value	Choice of: • Room temperature set-point • Supply air temperature set point Set points are dependent on operating modes (see page 40).
Control function	Heating or cooling based on room temperature (see page 40) Cascade control of room temperature set point against calculated supply air temperature (see page 41) Choice of: • Fan-coil unit fan speed control based on the heater/cooling valve percentage (see page 42) • Fan-coil unit fan speed control based on temperature (see page 42) Condensation Protection Ventilation during the night (see page 41)
Alarms	Frost setting based on minimum return air temperature control Room temperature alarm limits
Operating inputs (see page 37)	Comset CX Operation through (permanent voltage contact, pulse contact, motion detector or access detector) Potentiometer for desired room temperature setting or offset against room temperature set point Fan operation
Control inputs (see page 37)	Room temperature Supply air temperature Window contact Condensation thermostat System operating signal for on/off or 2-stage electrical heater System failure signal for on/off or 2-stage electrical heater Maximum temperature thermostat - electric heater Flow switch (electric heater) Heating system return air temperature (price supplement, see page 39, 'Additional Comforte CX measurement') Air quality (price supplement, see page 39, 'Additional Comforte CX measurement') Relative humidity (price supplement, see page 39, 'Additional Comforte CX measurement')
Outputs (see page 38)	Cooling valve Heating valve Split range valve (see page 41) Electric heater Fan Recirculation damper (price supplement, see page 39, 'Additional Comforte CX control function') Supply air damper (price supplement, see page 39, 'Additional Comforte CX control function')

Other controls	
Lighting	See page 35
Sunblind	See page 36
Compri HX accessible inputs	digital input (price supplement, see page 35, 'Compri HX accessible Comforte CX digital input') analogue input (price supplement, see page 35, 'Compri HX accessible Comforte CX analogue input')
Compri HX accessible outputs	digital output (price supplement, see page 35, 'Compri HX accessible Comforte CX digital output') controller (price supplement, see page 35, 'Compri HX accessible Comforte CX controller')

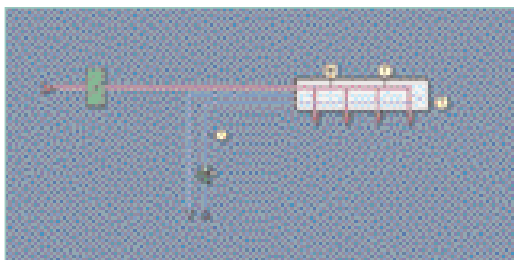
Room heating



Climate	
Control value	Room temperature set-point Set point is dependent on operating mode (see page 40).
Control function	Heating control based on room temperature
Alarms	Room temperature alarm limits
Operating inputs (see page 37)	Comset CX Operation through (permanent voltage contact, pulse contact, motion detector or access detector) Potentiometer for desired room temperature setting or offset against room temperature set point
Control inputs (see page 37)	Room temperature Window contact System operating signal for on/off or 2-stage electrical heater System failure signal for on/off or 2-stage electrical heater Maximum temperature thermostat - electric heater Air quality (price supplement, see page 39, 'Additional Comforte CX measurement') Relative humidity (price supplement, see page 39, 'Additional Comforte CX measurement')
Outputs (see page 38)	Heating valve Electric heater

Other controls	
Lighting	See page 35
Sunblind	See page 36
Compri HX accessible inputs	digital input (price supplement, see page 35, 'Compri HX accessible Comforte CX digital input') analogue input (price supplement, see page 35, 'Compri HX accessible Comforte CX analogue input')
Compri HX accessible outputs	digital output (price supplement, see page 35, 'Compri HX accessible Comforte CX digital output') controller (price supplement, see page 35, 'Compri HX accessible Comforte CX controller')

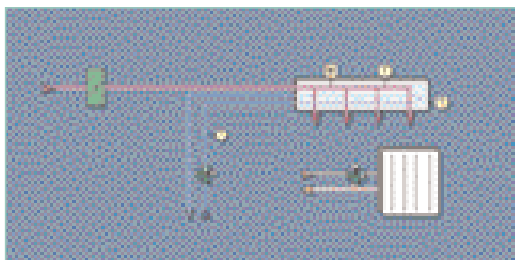
Ceiling-mounted cooling



Climate control	
Control value	Room temperature set-point Set point is dependent on operating mode (see page 40).
Control function	Cooling control based on room temperature Dew point control based on minimum supply water temperature (see page 41) Ventilation during the night (see page 41) Cooling valve temperature control (see page 41) Condensation Protection
Alarms	Dew point threshold (disable function) (see page 41) Room temperature alarm limits
Operating inputs (see page 37)	Comset CX Operation through (permanent voltage contact, pulse contact, motion detector or access detector) Potentiometer for desired room temperature setting or offset against room temperature set point
Control inputs (see page 37)	Room temperature Supply air temperature Window contact Condensation thermostat Cooling temperature (price supplement, see page 39, 'Additional Comforte CX measurement') Dew point temperature (price supplement, see page 39, 'Additional Comforte CX measurement') Air quality (price supplement, see page 39, 'Additional Comforte CX measurement') Relative humidity (price supplement, see page 39, 'Additional Comforte CX measurement')
Outputs (see page 38)	Cooling valve Supply damper (price supplement, see page 39, 'Additional Comforte CX control function')

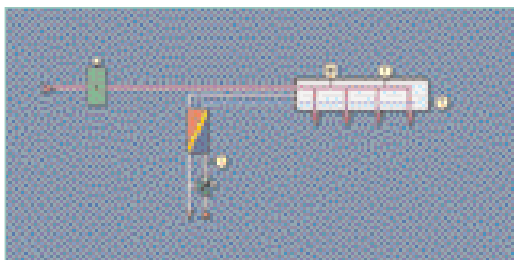
Other controls	
Lighting	See page 35
Sunblind	See page 36
Compri HX accessible inputs	digital input (price supplement, see page 39, 'Compri HX accessible Comforte CX digital input') analogue input (price supplement, see page 39, 'Compri HX accessible Comforte CX analogue input')
Compri HX accessible outputs	digital output (price supplement, see page 39, 'Compri HX accessible Comforte CX digital output') controller (price supplement, see page 39, 'Compri HX accessible Comforte CX controller')

Ceiling-mounted cooling with room heating



Climate control	
Control value	Room temperature set-point Set point is dependent on operating mode (see page 40).
Control function	Cooling control based on room temperature Room temperature heating control Ventilation during the night (see page 41) Dew point control based on minimum supply water temperature (see page 41) Cooling valve temperature control (see page 41) Condensation Protection
Alarms	Dew point threshold (disable function) (see page 41) Room temperature alarm limits
Operating inputs (see page 37)	Comset CX Operation through (permanent voltage contact, pulse contact, motion detector or access detector) Potentiometer for desired room temperature setting or offset against room temperature set point
Inputs (see page 37)	Room temperature Supply air temperature Window contact Condensation thermostat Cooling temperature (price supplement, see page 39, 'Additional Comforte CX measurement') Air quality (price supplement, see page 39, 'Additional Comforte CX measurement') Relative humidity (price supplement, see page 39, 'Additional Comforte CX measurement')
Outputs (see page 38)	Room heating valve Cooling valve Supply air damper (price supplement, see page 39, 'Additional Comforte CX control function')
Other controls	
Lighting	See page 35
Sunblind	See page 36
Compri HX accessible inputs	digital input (price supplement, see page 39, 'Compri HX accessible Comforte CX digital input') analogue input (price supplement, see page 39, 'Compri HX accessible Comforte CX analogue input')
Compri HX accessible outputs	digital output (price supplement, see page 39, 'Compri HX accessible Comforte CX digital output') controller (price supplement, see page 39, 'Compri HX accessible Comforte CX controller')

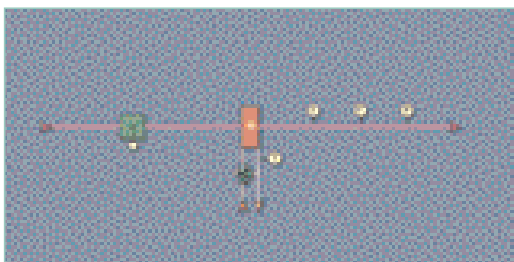
Ceiling-mounted air-conditioning



Climate control	
Control value	Room temperature set-point Set point is dependent on operating mode (see page 40).
Control function	Heating or cooling based on room temperature (see page 40) Dew point control based on minimum supply water temperature (see page 41) Change-over (2 and 4 pipe systems)
Alarms	Dew point threshold (disable function) (see page 41) Room temperature alarm limits Frost setting based on minimum return air temperature control Condensation Protection
Operating inputs (see page 37)	Comset CX Operation through (permanent voltage contact, pulse contact, motion detector or access detector) Potentiometer for desired room temperature setting or offset against room temperature set point
Control inputs (see page 37)	Room temperature Supply air temperature Window contact Condensation thermostat Cooling temperature (price supplement, see page 39, 'Additional Comforte CX measurement') Heating system return air temperature (price supplement, see page 39, 'Additional Comforte CX measurement') Dew point temperature (price supplement, see page 39, 'Additional Comforte CX measurement') Air quality (price supplement, see page 39, 'Additional Comforte CX measurement') Relative humidity (price supplement, see page 39, 'Additional Comforte CX measurement')
Outputs (see page 38)	Heater/cooling valve Extra change-over heating valve (4 pipe systems) Extra change-over cooling valve (4 pipe systems) Supply air damper (price supplement, see page 39, 'Additional Comforte CX control function')

Other controls	
Lighting	See page 35
Sunblind	See page 36
Compri HX accessible inputs	digital input (price supplement, see page 39, 'Compri HX accessible Comforte CX digital input') analogue input (price supplement, see page 39, 'Compri HX accessible Comforte CX analogue input')
Compri HX accessible outputs	digital output (price supplement, see page 39, 'Compri HX accessible Comforte CX digital output') controller (price supplement, see page 39, 'Compri HX accessible Comforte CX controller')

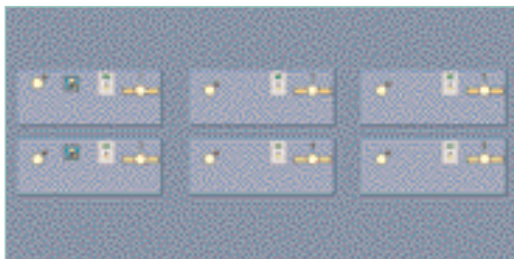
VAV box system with or without heater



Climate control	
Control value	Choice of: • Room temperature set-point • Air speed set-point • Air volume set-point Air quality set-point Set points are dependent on operating modes (see page 40).
Control function	Choice of: • Heating or cooling based on room temperature (see page 40) • VAV air volume control based on valve characteristics (see page 43) • VAV air volume regulation with air volume measurement (see page 43) • VAV air volume regulation with air speed measurement (see page 43) • VAV temperature control (see page 44) • VAV temperature control with air volume measurement (see page 44) • VAV temperature control with air speed measurement (see page 45) Choice of: • VAV air quality control (see page 45) • VAV air quality control with air volume measurement (see page 45) • VAV air quality control with air speed measurement (see page 45) Ventilation during the night (see page 41)
Alarms	Heater return air temperature alarm (disable function) Frost setting based on minimum return air temperature control Room temperature alarm limits
Operating inputs (see page 37)	Comset CX Operations through (permanent voltage contact, pulse contact, motion detector or access detector) Potentiometer for desired room temperature setting or offset against room temperature set point
Control inputs (see page 37)	Room temperature Window contact Choice of: • Supply duct pressure • Supply duct air volume • Supply duct air speed Supply air damper position signal System operating signal for on/off or 2-stage electrical heater System failure signal for on/off or 2-stage electrical heater Maximum temperature thermostat - electric heater Heater return air temperature (price supplement, see page 39, 'Additional Comforte CX measurement') Air quality (price supplement, see page 39, 'Additional Comforte CX measurement') Relative humidity (price supplement, see page 39, 'Additional Comforte CX measurement')
Outputs (see page 38)	Heating valve Electric heater Supply air damper
Other controls	
Lighting	See page 35
Sunblind	See page 36
Compri HX accessible inputs	digital input (price supplement, see page 39, 'Compri HX accessible Comforte CX digital input') analogue input (price supplement, see page 39, 'Compri HX accessible Comforte CX analogue input')
Compri HX accessible outputs	digital output (price supplement, see page 39, 'Compri HX accessible Comforte CX digital output') controller (price supplement, see page 39, 'Compri HX accessible Comforte CX controller')

Lighting

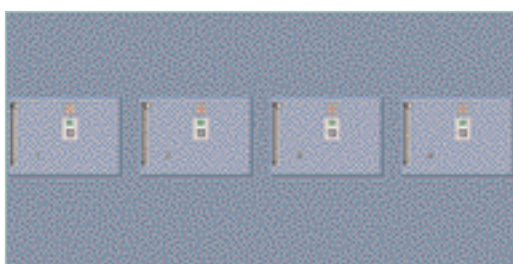
The Comforte CX is capable of switching lighting groups. Lighting control is a standard feature of the climate control modules, however lighting operation can take place entirely independently of climate control. Dependent on I/O usage, the Comforte CX can switch up to a maximum of 6 lighting groups (6 on/off groups or 4 on/off groups and 2 dimmer groups). The lighting control facility offers many benefits for both individual and central operation, such as the use of standard switchgear, the use of motion detectors, light level control and the ability to switch lighting on and off centrally.



Lighting	
Control value	On/off Dimmer set point (percentage) Light level set point
Control function	Choice of: • On/off • Dimmer control with release signal From the Compri HX • Central switch-on (lighting is switched centrally, other switches are overruled) • Central on pulse (lighting is switched on centrally, thereafter responds to individual switches) • Broadcast pulse (lighting is switched off centrally)
Operating inputs (see page 37)	Comset CX (lighting key takes priority over occupancy) Operation through (permanent voltage contact, pulse contact, motion detector or access detector)
Control inputs (see page 37)	Lighting level (price supplement, see page 35, 'Additional Comforte CX measurement')
Outputs (see page 38)	Lighting group 1,2: Lighting on/off Dimmer Dimmer control with release Lighting group 3-6 (price supplement, see page 35, 'Additional Comforte CX lighting control'): Lighting on/off Dimmer Dimmer control with release

Sunblind

The Comforte CX is capable of opening and closing (up/down, to the left or right) and changing the angle (pivot action) of sunblinds and slatted blinds. A combination of both is also possible. The sunblind control feature offers many benefits for both individual and central operation. Different kinds of sunblind can be operated at an individual level: open and closed using a single output and open and closed with intermediate positions if the sunblind is controlled via two outputs. Central control via the Compri HX makes it possible to disable the system for window-cleaners, in high winds or during heavy rain conditions. The Compri HX can also detect the whereabouts of the sun and turn slatted blinds to the best position to prevent direct sunlight entering a room. Sunblind control is a standard feature of the climate control modules; however control and operation of sunblinds can take place entirely independently of climate control.



Sunblind	
Control value	Up/down/angle control Position (percentage) Slatted blind set points (percentage) Seasonal slatted blind position
Control function	Up/down (control using a single output based on operation time) Up/down/full-stop (control using two outputs) Manual operation takes precedence over light control Disable function via the Compri HX
Operating inputs (see page 37)	Comset CX Operation through (permanent voltage contact, pulse contact, motion detector or access detector)
Outputs (see page 38)	Sunblind group 1: Sunblind up/down Sunblind full-stop/up/down Sunblind open/close Sunblind full-stop/open/close Tilt system Sunblind group 2 (price supplement, see page 39, 'Additional Comforte CX sunblind control'): Sunblind up/down Sunblind full-stop/up/down Sunblind open/close Sunblind full-stop/open/close Tilt system Sunblind group 3-4 (price supplement, see page 39, 'Additional Comforte CX sunblind control'): Sunblind up/down Sunblind full-stop/up/down Sunblind open/close Sunblind full-stop/open/close Tilt system

Whenever one sunblind group with tilt system is being used, a maximum of two additional sunblind groups are allowed within the Comforte CX. In case two sunblind groups with tilt system are being used, there is no additional sunblind group allowed within the Comforte CX.

Inputs used

Depending on the control module to be used and the configuration, the various different sensors use the following inputs of the Comforte CX. The Compri HX may also use a limited number of inputs on the Comforte CX.

Inputs required for switching	Digital inputs	Universal inputs
Fan operation (off/on)	1	
Fan operation (auto/off/on)	2	
Fan operation (auto/0/1/2)	3	
Fan operation (auto/0/1/2/3)	4	
Sunblind operation (up/down)	1	
Sunblind operation (up/down or left/right)	2	
Sunblind operation (up/down/full-stop and left/right)	4	
Permanent voltage contact	1	
Potentiometer for desired room temperature		1
Potentiometer offset against room temperature set point		1
Pulse contact for occupancy	1	

Inputs required for control	Digital inputs	Universal inputs
Room temperature		1
Supply air temperature		1
Cooling temperature		1
Heating return air temperature		1
Motion detector	1	
Access detector	1	
Window contact	1	
Condensation thermostat	1	
Lighting level		1
Air quality		1
Air supply volume measurement		1
Supply air damper position signal (VAV box)		1
Air speed		1
Relative humidity		1
Flow switch (electric heater)	1	
System operating signal for on/off or 2-stage electrical heater	1	
System failure signal for on/off or 2-stage electrical heater	1	
Maximum temperature thermostat - electric heater	1	
Fan operative signal	1	
Fan failure signal	1	
Fan operative signal - low speed	1	
Fan operative signal - high speed	1	

Required Compri HX accessible inputs	Digital inputs	Universal inputs
Compri HX accessible Comforte CX digital input*	1	
Compri HX accessible Comforte CX analogue input*		1

* Maximum of 1 per Comforte CX

Available inputs	Digital inputs	Universal inputs
Base module Comforte CX	3	2

Outputs used

Depending on the control module to be used and the configuration, the various different control functions use the following outputs of the Comforte CX. The Compri HX may also use a limited number of outputs on the Comforte CX.

Required outputs	Type	Digital outputs	Analogue outputs
Heating valve	Analogue output		1
	3 position control	2	
	Pulse/pause control	1	
	Open/close	1	
Cooling valve	Analogue output		1
	3 position control	2	
	Pulse/pause control	1	
	Open/close	1	
Split range valve	Analogue output		1
Extra change-over heating valve	Open/close	1	
Extra change-over cooling valve	Open/close	1	
Electric heater	On/off	1	
	Analogue output		1
	Analogue output with release signal	1	1
	2-stage	2	
Supply air damper (not VAV)	Open/close	1	
Exhaust damper (not VAV)	Open/close	1	
Supply air damper (VAV box)	Analogue output		1
	3 position control	2	
Fan	On/off	1	
	Low/high	2	
	Low/medium/high	3	
Lighting	Lighting on/off	1	
	Dimmer		1
	Dimmer control with release	1	1
Sunblind up/down	1 output	1	
	2 outputs	2	
Sunblind stop/up/down	2 outputs	2	
Sunblind open/closed	1 output	1	
	2 outputs	2	
Sunblind stop/open/closed	2 outputs	2	
Automatic angle control	2 outputs	2	
	Uses the sunblind outputs	0	

Required Compri HX accessible outputs		Digital outputs	Analogue outputs
Compri HX accessible Comforte CX digital output*	Digital output	1	
Compri HX accessible Comforte CX controller*	Modulating output (analogue output)		1
	Modulating output (3 position control)	2	

* Maximum of 1 per Comforte CX

Available outputs	Maximum	Digital outputs	Analogue outputs
Base module Comforte CX	4 I/O modules	3	2
Fan speed module RO1-3	1 per base module	3	
Lighting module RO2-1L	2 per base module	2	
Sunblind module RO2-2	2 per base module	4	
Triac output module SO4-1	1 per base module	4	

Explanatory notes

Price supplement

In addition to hardware, the price of the Comforte CX base module also includes control software with standard measurements and control functions. The Comforte CX control modules also include additional measurements and control functions for which a purchase price supplement is charged. There are two kinds of additional measurements and control functions:

- additional measurements and control functions for the Comforte CX, where the control is integrated in the Comforte CX itself,
- additional measurements and control functions for the Comforte CX, where the control is integrated in the Compri HX.

Price supplements for additional Comforte CX measurements and control functions

Price supplements are charged for additional measurements and control functions for the Comforte CX itself. Relative humidity measurement, needed for dew point control, is an example of an optional measurement. If this measurement is required, an 'Additional Comforte CX measurement' option must also be purchased. The table below describes ordering information for these additions.

Additional Comforte CX measurements and control functions	Part number
Additional Comforte CX measurement	540100
Additional Comforte CX control function	540101
Additional Comforte CX lighting control	540102
Additional Comforte CX sunblind control	540103

Price supplements for additional Compri HX accessible measurements and control functions

Where control functions cannot be achieved with the Comforte CX control module, the control options offered by the Compri HX can be used. Measurements and messages can be read in as network variables by a Compri HX, control functions in the Comforte CX can be performed via network variables from the Compri HX. The table below describes ordering information for these additions.

Additional Compri HX accessible measurements and control functions	Part number
Compri HX accessible Comforte CX digital input	540104
Compri HX accessible Comforte CX analogue input	540105
Compri HX accessible Comforte CX digital output	540106
Compri HX accessible Comforte CX controller	540107

Logging

Logging of measurements, analogue outputs and PI control algorithm positions are possible within the Comforte CX. A logging duration of between 3 minutes (1 second intervals) and 96 hours (32 minute intervals) can be set for each Comforte CX. The data is stored in RAM memory (RAM memory requires a supply voltage in order to store data). Long-term storage is possible via the Compri HX using TC History.

Messages

The Comforte CX has real-time messages and alarms for the display of digital inputs and internal statuses.

The Comforte CX records these messages and alarms in a log. All messages and alarms are stored in RAM memory (RAM memory requires a supply voltage in order to store data).

The Compri HX can be used to process real-time messages and alarms by printing them, broadcasting them via Short Message Service, passing them to TC ServeCenter or passing them to TC WebVision/TC Vision. The Compri HX in its capacity as network manager can also record messages and alarms in a log, meaning that they will be preserved in the event of a power failure.

Network variables

A number of variables in the Comforte CX are used as network variables by the Comforte CX and the Compri HX. The Compri HX can use these network variables to read in statuses and measurements from the Comforte CX and pass control signals to the Comforte CX. Priva will provide detailed information about the availability of network variables for the Compri HX on demand.

Clustering

Room use in offices changes more and more frequently. The Comforte CX offers a wide range of features that greatly simplify control technology remodelling required by changes in the use of (office) areas. Control units within a single BACnet CX network can be categorised in software-defined clusters. All the control units in a cluster generate control signals in the same way and work with a single desired room temperature, for example. Different clusters can be used for climate control and separate lighting and sunblind groups, meaning for example that the climate settings in a single area can be interlinked, but that the lighting settings are independent of each other.

In the case of controlling dampers, shut-off valves and sunblind motors, clustering works on the basis of the desired control function for the individual control units without excluding the option of different characteristics and operation times.

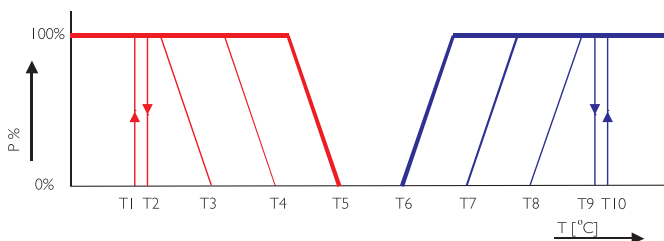
The Comset CX connected to each Comforte CX can be left in place, these automatically comply with the common settings of the different control units in the cluster.

Operating mode

The Comforte CX's operating mode determines its control function. The operating mode can be set to the following values:

- 'Comfort': the room is in use, the Comforte CX controls room climate.
- 'Stand-by': the room is not in use, the Comforte CX ensures that the temperature is neither too high nor too low. 'Stand-by' is a sort of intermediary state which allows rapid transition to the 'Comfort' mode.
- 'Night': the minimum/maximum room temperature monitoring function of the Comforte CX is active, even though the temperature can still be set as desired.

Heating and cooling control based on room temperature



Legend	
P	Control percentage heating/cooling valve
T	Temperature
T1	Lower threshold minimum room temperature monitoring (on)
T2	Upper threshold minimum room temperature monitoring (off)
T3	Desired room temperature – night heating
T4	Desired room temperature – stand-by heating
T5	Desired room temperature – comfort heating
T6	Desired room temperature – comfort cooling
T7	Desired room temperature – stand-by cooling
T8	Desired room temperature – night cooling
T9	Upper threshold maximum room temperature monitoring (off)
T10	Lower threshold maximum room temperature monitoring (on)

This control function can be used for induction units, fan-coil units, ceiling-mounted air-conditioning and VAV box systems. The Comforte CX activates the shut-off valve of the heater and the cooler depending on the operating mode and measured room temperature. Offsets against the desired temperature can be set up for the 'Comfort', 'Stand-by' and 'Night' operating modes. The Comforte CX uses separate on/off threshold settings to monitor room temperature in order to prevent constant cycling.

If a window is open, the Comforte CX will turn off the heating/cooling and the room will be monitored against minimum/maximum temperature. The diagram and table at page 40 show how heating and cooling is controlled.

Heating and cooling control based on supply air temperature

This control function for the induction unit is similar to the 'Heating and cooling control based on room temperature', however there are no separate temperature offsets for heating and cooling. There are separate set points for the 'Comfort', 'Stand-by' and 'Night' operating modes.

Cascade control of room temperature set point against calculated supply air temperature

The cascade control function is available for induction units and fan-coil units. With the aid of a PI control algorithm, the Comforte CX determines a desired supply air temperature based on the desired and measured room temperature. The Comforte CX then adjusts the heater or cooler against the desired and measured supply air temperature.

Damper temperature control - cooling

In the case of ceiling-mounted cooling systems and air-conditioning systems, the Comforte CX opens or closes the damper as a function of the desired and the measured room temperature.

Split-range

In the case of induction units and fan-coil units, regulation of the heating and cooling system can take place via a single analogue output. The 5V-10V control range is used to regulate cooling (0%-100%), while the 5V-0V control range is used for heating control (0%-100%).

Change-over

In a change-over system (induction unit or ceiling-mounted air-conditioning), the water flows through a combination heater/cooler. 2 or 4 supply lines are available, which, depending on the situation, supply hot or cold water. When controlling a 2 pipe system, the Compri HX passes change-over signals to the Comforte CX.

Dew point control based on minimum supply water temperature

The dew point control function prevents condensation formation in the case of ceiling-mounted cooling/air-conditioning systems. If the desired supply water temperature of the cooler drops below the dew point temperature by a pre-set value during cooling, the cooler is adjusted back. The dew point temperature:

- is calculated on the basis of relative humidity and room temperature measurements,
- is available in the Comforte CX as a reading,
- is available in the Compri HX as a reading.

Dew point threshold (disable function)

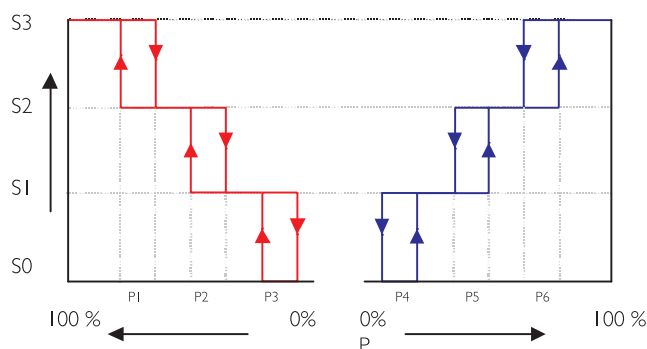
If the desired supply water temperature of the cooler drops below the dew point temperature by a pre-set value during cooling via ceiling-mounted coolers/air-conditioners, an alarm signal is generated and the cooling is turned off. This alarm disables the cooling system: the cooler can only be restarted after it has been reset, in TC WebVision for example. The dew point temperature is calculated on the basis of relative humidity and room temperature measurements.

Ventilation during the night

The Comforte CX receives a variable from the Compri HX that indicates whether or not night ventilation needs to be activated. On the basis of this variable, the Comforte CX regulates the damper and/or switches the supply fan for night ventilation.

Fan-coil unit fan speed control based on the heating/cooling valve percentage

This is a control function for the fan of a fan-coil unit. Depending on the percentage of heat demand/cooling demand, the Comforte CX switches the fan as shown in the schematic below. If a window is open, the Comforte CX will turn the ventilation down to the lowest setting possible.



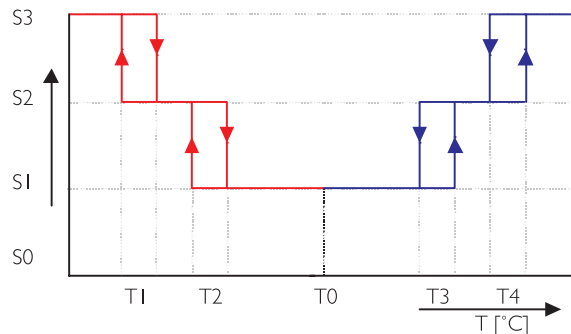
Legend	
P	Percentage heating/cooling valve
P1	On/off threshold for high speed operation based on the heating valve percentage
P2	On/off threshold for medium speed operation based on the heating valve percentage
P3	On/off threshold for low speed operation based on the heating valve percentage
P4	On/off threshold for low speed operation based on the cooling valve percentage
P5	On/off threshold for medium speed operation based on the cooling valve percentage
P6	On/off threshold for high speed operation based on the cooling valve percentage
S0	Fan off
S1	Low speed
S2	Medium speed
S3	High speed

Fan-coil unit fan speed control based on temperature

The Comforte CX switches the fan of a fan-coil unit. The way the fan is switched is configurable:

- as soon as the 'Comfort' or 'Stand-by' operating modes become active,
- as soon as the heater or cooler is switched on.

Depending on the difference between desired room temperature and measured room temperature, the Comforte CX switches the fan to a different speed. The switching thresholds for the various fan speeds can be defined by the user. If the room temperature monitoring function switches on the heating or cooling, the fan is switched to its highest setting.



Legend	
T	Temperature
T0	Desired room temperature
T1	Switching threshold – high speed
T2	Switching threshold – medium speed
T3	Switching threshold – medium speed
T4	Switching threshold – high speed
S0	Fan off
S1	Low speed mode
S2	Medium speed mode
S3	High speed mode

VAV air volume control based on valve characteristics

VAV air volume control based on valve characteristics

This control function regulates the damper. The heating valve is controlled separately as a function of room temperature. This VAV air volume control function works as follows:

- The Comforte CX has been programmed with set points for the desired air volume flow during the 'day' and 'night' periods.
- The Comforte CX receives a variable from the Compri HX that indicates whether the 'day' period or the 'night' period is active.
- The Comforte CX has been programmed with a linear characteristic that defines the relationship between the desired air volume flow against the position of the damper.
- The Comforte CX calculates the position of the damper as a function of the desired air volume flow and the linear characteristic.

VAV air volume regulation with air volume measurement

This control function regulates the damper. The heating valve is controlled separately as a function of room temperature. This VAV air volume control function works as follows:

- The Comforte CX has been programmed with a set point for the desired air volume flow.
- The Comforte CX determines the actual air volume flow (via pressure measurement and a programmable flow factor K_v , air speed or direct air volume flow measurement).
- The Comforte CX regulates the damper via a PI control algorithm in such a way that the desired air volume flow is achieved.

VAV air volume regulation with air speed measurement

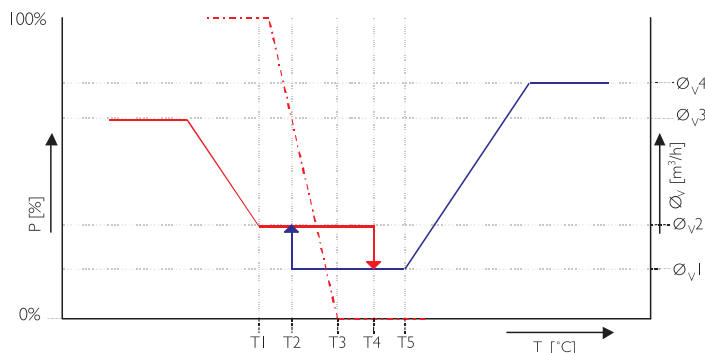
This control function regulates the damper. The heating valve is controlled separately as a function of room temperature. This VAV air volume control function works as follows:

- The Comforte CX has been programmed with a set point for the desired air speed.
- The Comforte CX measures the actual air speed.
- The Comforte CX regulates the damper via a PI control algorithm in such a way that the desired air speed is achieved.

VAV temperature control

This control function regulates the damper and the heating valve, in the sequence indicated. There are separate settings for the 'Comfort' and 'Stand-by' operating modes. The procedure is as follows:

- The Comforte CX has been programmed with a set point for the desired room temperature.
- The Comforte CX measures the room temperature.
- The Comforte CX regulates the damper via a PI control algorithm (or the heating valve, depending on the sequence indication) in such a way that the desired room temperature is achieved.



Legend	
—	Damper in heating mode
- - - - -	Heating valve
—	Damper in cooling mode
P	Control percentage
Øv1	Minimum air flow through damper when cooling
Øv2	Minimum air flow through damper when heating
Øv3	Maximum air flow through damper when heating
Øv4	Maximum air flow through damper when cooling
T1	Desired room temperature - damper heating
T2	Room temperature at which the damper switches from cooling to heating
T3	Desired room temperature - heater
T4	Room temperature at which the damper switches from heating to cooling
T5	Desired room temperature - damper cooling

VAV temperature control with air volume measurement

This control function regulates the damper and the heating valve, in the sequence indicated. There are separate settings for the 'Comfort' and 'Stand-by' operating modes. The procedure is as follows:

- The Comforte CX has been programmed with a set point for the desired room temperature.
- De Comforte CX measures the room temperature.
- With the aid of a PI control algorithm, the Comforte CX determines the desired air volume flow as a function of the desired room temperature and the measured room temperature.
- The Comforte CX determines the actual air volume flow (via pressure measurement and a programmable flow factor Kv, air speed or direct air volume flow measurement).
- The Comforte CX regulates the damper via a PI control algorithm in such a way that the desired air volume flow is achieved.
- Once the maximum position of the damper has been reached, the Comforte CX uses a PI control algorithm to determine the position of the heating valve as a function of the desired and measured room temperature.

VAV temperature control with air speed measurement

This control function regulates the damper and the heating valve, in the sequence indicated. There are separate settings for the 'Comfort' and 'Stand-by' operating modes. The procedure is as follows:

- The Comforte CX has been programmed with a set point for the desired room temperature.
- De Comforte CX measures the room temperature.
- With the aid of a PI control algorithm, the Comforte CX determines the desired air speed as a function of the desired room temperature and the measured room temperature.
- De Comforte CX measures the actual air speed.
- The Comforte CX regulates the damper via a PI control algorithm in such a way that the desired air speed is achieved.
- Once the maximum position of the damper has been reached, the Comforte CX uses a PI control algorithm to determine the position of the heating valve as a function of the desired and measured room temperature.

VAV air quality control

In addition to VAV air volume flow control, VAV air volume flow regulation and VAV temperature control, an extra air quality control function can be catered for in a VAV box control system. This air quality control ensures that the air volume flow increases when out-of-specification air quality is detected. This control function works as follows:

- The Comforte CX has been programmed with a set point for the desired air quality (%) or CO₂ level (PPM).
- The Comforte CX measures the air quality (%) or CO₂ level (PPM) using an appropriate sensor.
- The Comforte CX determines the control percentage of the damper in order to regulate air quality using a PI control algorithm.
- If this control percentage is greater than the control percentage for main control (air volume flow control, air volume flow regulation or temperature control), the air quality control percentage takes precedence.

VAV air quality control with air volume measurement

In addition to VAV air volume flow control, VAV air volume flow regulation and VAV temperature control, an extra air quality control function can be catered for in a VAV box control system. This air quality control ensures that the air volume flow increases when out-of-specification air quality is detected. This control function works as follows:

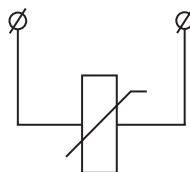
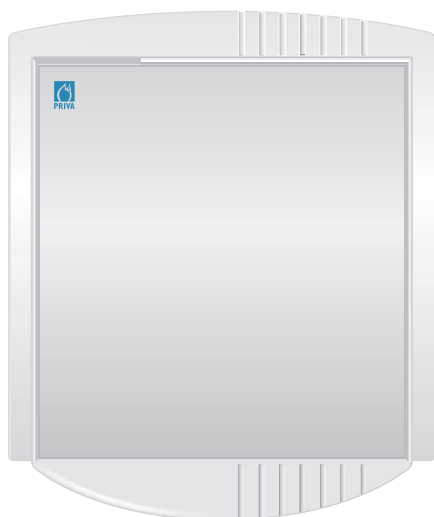
- The Comforte CX has been programmed with a set point for the desired air quality (%) or CO₂ level (PPM).
- The Comforte CX measures the air quality (%) or CO₂ level (PPM) using an appropriate sensor.
- With the aid of a PI control algorithm, the Comforte CX determines the desired air volume flow as a function of the desired air quality and the measured air quality.
- The Comforte CX determines the actual air volume flow (via pressure measurement and a programmable flow factor Kv, air speed or direct air volume flow measurement).
- The Comforte CX determines the control percentage of the damper in order to regulate air quality using a PI control algorithm.
- If this control percentage is greater than the control percentage for main control (air volume flow control, air volume flow regulation or temperature control), the air quality control percentage takes precedence.

VAV air quality control with air speed measurement

In addition to VAV air volume flow control, VAV air volume flow regulation and VAV temperature control, an extra air quality control function can be catered for in a VAV box control system. This air quality control ensures that the air volume flow increases when out-of-specification air quality is detected. This control function works as follows:

- The Comforte CX has been programmed with a set point for the desired air quality (%) or CO₂ level (PPM).
- The Comforte CX measures the air quality (%) or CO₂ level (PPM) using an appropriate sensor.
- With the aid of a PI control algorithm, the Comforte CX determines the desired air speed as a function of the desired air quality and the measured air quality.
- The Comforte CX measures the actual air speed.
- The Comforte CX determines the control percentage of the damper (to regulate air quality using a PI control algorithm).
- If this control percentage is greater than the control percentage for main control (air volume flow control, air volume flow regulation or temperature control), the air quality control percentage takes precedence.

Comset 50K



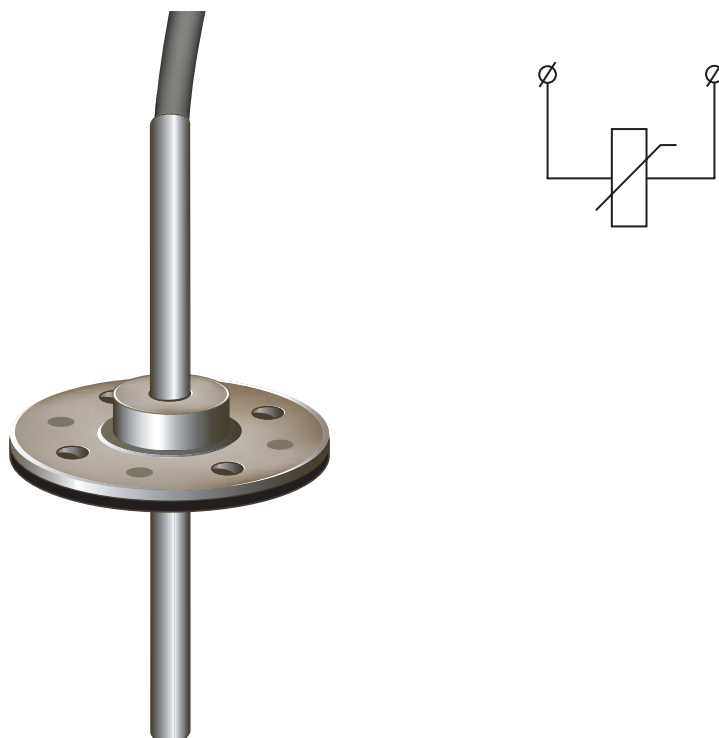
The Comset 50K is a room temperature sensor for use in areas where temperature measurement is required without the ability to change settings. This sensor can be connected to the Comforte CX using a twin wire cable. The Comset 50K features openings in the housing that ensure accurate temperature measurement. The Comset CX base can be fixed to the wall or mounted in a flush-fit housing. The front panel of the Comset CX simply clicks onto the base.

General	
Component	Comset 50K
Part number	200164
Construction	Base with ventilation openings for temperature measurement, front panel
Material base/front panel	ABS
Front panel colour	Off-white, similar to RAL9010
Base colour	Light grey, similar to RAL7035
Dimensions	95.2 x 112.4 x 23.5 (wxhxd in mm)
Weight	66 grammes
Face-fit mounting	Base has mounting holes to suit standard flush-fit boxes
Cable feed	Opening in base Snap-out moulded apertures in base (bottom/top)
Permissible ambient operating temperature	0 to 40°C
Permissible transportation/storage temperature	-20 to 70°C
Permissible ambient relative humidity	< 90 % at 30°C (non-condensing)
Protective rating	IP20

Connection	
Type of connector	RJ45 (not in combination with Comforte CX) Screw terminal
Cross section for screw terminal	0.35 to 1.5 mm ² (single core) 0.35 to 1 mm ² (multi-core) 0.35 to 0.75 mm ² (multi-core with ferrule connector)
Maximum cable length	100 m

Temperature sensor	
Measurement principle	NTC (resistance sensor)
Measuring accuracy	± 0.2°C
Accuracy (in combination with Comforte CX)	± 0.3°C

Flying lead temperature sensor 50K



The Priva flying lead temperature sensor 50K is a universal duct and room temperature sensor, which can be connected to a universal input of the Comforte CX and the Compri HX. The flying lead temperature sensor can be supplied with or without a flange. When supplied with a flange (including a rubber seal), it can be used as a duct-mounted or ceiling-mounted temperature sensor. When supplied without a flange, it can be used as a universal room temperature sensor.

General		
Component	Flying lead temperature sensor 50K (excluding flange)	Flying lead temperature sensor 50K (including flange)
Part number	111041	111042
Temperature sensor dimensions	100 x 6 (lxd)(in mm)	
Temperature sensor material	304 grade stainless steel, with silicon paste core	
Cable length	2 m	
Cable cross section	2 x 0,5 mm ²	
Cable material	PVC flex, ready-stripped, unshielded	
Measurement principle	NTC (resistance sensor)	
Permissible ambient operating temperature	10 to 50°C	
Measuring accuracy	± 0.2°C	
Accuracy (in combination with Comforte CX)	± 0.3°C	

Priva Building Intelligence develops intelligent building management systems that leave nothing to chance. Priva supplies its products exclusively via the Priva Partner Network; a select group of well-known installers and system integrators, who have been fully trained in the specification, installation and use of our intelligent systems.

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