Click to prove you're human

Page 2Page 33ENGWarranty on materials: 2 years (from the date of production, excluding Approval: the quality and safety of CAREL INDUSTRIES Hq products are NO POWER & SIGNAL CABLES TOGETHERREAD CAREFULLY IN THE TEXT!Page 4Page 55ENG5552.4 Dimensions .....155553.3 Connectors .....254.2 Power supply .....265.1 Introduction .....365 5355 where featured) .....547.3 Smartkey .....59 and other information .....595 .....625Page 6Page 77ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014pCO sistema: CARELs proposal for programmable controllers.It consists of programmable controllers, user interfaces, gateways and communication interfaces, and remote management systems to o er the HVAC/R market a control system thats powerful, exible and easy to interface to the most commonly-used building management systems. pCO sistema is very reliable and can be easily customised to di erentiate the air-conditioning or refrigeration unit control system.All versions of these controllers use a 32-bit microprocessor and either 4 or 8 MBytes of memory so as to ensure high performance in terms of speed and memory space available. The pCO sistema controllers also come in di erent sizes according to the number of inputs and outputs, giving the best price/performance ratio. Given the increasing need for integration, the pCO sistema family controllers can interface with some of the most commonly-used serial communication standards, and when tted with optional cards can be integrated into BMS systems.The pCO* family can connect di erent types of sensors (e.g. ratiometric, NTC, 4 to 20 mA, etc.); a built-in terminal is available; there are one or two serial ports (depending on the model) to o er connection to controlled eld devices (valves, I/O expansions, electronic valve drivers). In addition, on models where featured, the controllers have 2 USB ports for uploading and downloading les. All these features place our controllers at a level of excellence in ful lling the needs of the HVAC/R market.The CAREL pCO sistema controllers can be programmed using 1Tool development software, o ering the following advantages:developed for the pCO can be simply and quickly transferred to another hardware platform and vice-versa, modifying only the inputs and outputs; eld.The use of 1Tool, moreover, ensures the customer the maximum level of privacy and self-management when developing new programs on their own. The possibility to use the same hardware for di erent applications allows standardisation, with the clear advantages of being able to feature in-circuit and functional testing and burn-in procedures on all of the products and consequently reach a high level of reliability, both overall and in terms of the individual electronic components.1Tool: exclusive, easy to use CAREL development software for programming, simulation, supervision and de nition of pLAN networks using CAREL terminals and pCO programmable controllers.The programmability of the pCO ensures absolute exibility of application. The same standard hardware can be used to control:Other types of programs can be developed to speci c customer requirements.The pCO architecture features:control program, and the set of terminals required for connection to the controlled devices (for example: valves, compressors, fans). The program and the parameters are saved permanently in the FLASH memory, preventing data loss in the event of power failure (without requiring a backup battery). The pCO also allows connection to a local pLAN network made up of a series of pCO boards and terminals. Each board can exchange information (any variable, digital or analogue, according to the application software) at high transmission speeds. connection to the supervisor/telemaintenance serial line, over the RS485 standard, is made using the optional serial cards (PCO004850) and the CAREL or Modbus communication protocol.keypad and LEDs to allow the programming of the control parameters (set point, di erential band, alarm thresholds) and basic functions by the user (ON/OFF, display of the controlled values, optional printing). The terminal does not have to be connected to the pCO for normal operation, but can be used for the initial programming of the funda-mental parameters.The power of the application software means that the user terminal allows:parameters, optionally protected by password;Page 88ENGpCO5 +0300009EN rel. 1.2 - 24.04.20145Large VersionC1NO1NO2NO3C1C4NO4NO5NO6C4C7NO7C7NO8C8NC8NO12C12NC12NO13C13NC13C9NO9NO10NO11C9GG0B1B2B3GND+VDC+VtermGND+5 VREFB4BC4B5BC5VGVG0Y1Y2Y3Y4ID1ID2ID3ID4ID5ID6ID7ID8IDC1B6B7B8GNDID9ID10ID11ID12IDC9ID13HID13IDC13ID14ID14HJ110111J24 J2 J3J4 J5 J7J8J20J21J14J11 pLANJ10J9J13J12J22J16 J17J18J15J6J193774465NO14C14NC14NO15C15NC15C16NO16NO17NO18C1689213ID15HID15IDC15ID16ID16HY5Y6ID17ID18IDC17B9BC9B10BC10161514FieldBus card BMS card8657121117J25 BMS2J26 FBus21819J23 FBus2input: 24 V 50...60 Hz / 28...36 Vmax. power: 45 VA/20 WFig. 2.a ExtraLarge VersionNO6C4rJ20 J21 J22 J19 C14NO14NO15NO16C14C17NO17NO18NO19NO20C17C25NO25NO26NO27NO28NO29C25C21NO21NO22NO23NO24C2111 12Fig. 2.bVersion with VALVE DRIVERNO4Y3aJ29J27J301324J281324J16C9NO9NO10NO11C9J15NO8C8NC8J17NO12C12NC12J18NO13C13NC13GNDVREFS1S2S3S4DI1DI2J8ID13ID14J7ID9ID10ID11ID12ICC9J6B6B7B8GNDVBATG0G212220J5ID1ID2ID3ID4ID5ID6ID7ID8IDC1Fig. 2.cPage 99ENGKey1.2.3.4.5.6.7.8.9.10.11.12.13.14.15.16.17.5)5VdcJ11-1 RX-/TX- RX-/TX- connector for RS485 connection to the pLAN J19-3 * IDC15 common for digital inputs 15 and 16 (negative pole J20-9 * IDC17 common for digital inputs 17 and 18 (negative pole Page 1010ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014power supply Versions without built-in valve driver: 24 Vac +10/-15% 50 to 60 Hz and 28 to 36 Vdc +10/-20%;maximum current 45 VA/20 WVersion with built-in valve driver with or without Ultracap module:24 Vac +10/-15% 50 to 60 Hz;maximum current: 80 VA/35 W (90VA / 40W when Ultracap is charging)terminal block with male/female plug-in connectors, max voltage 250 Vac; wire size: min. 0.5 mm2 - max 2.5 mm2CPU H8SX1651, 32 bit, 44 MHzFLASH memory 4MB (8MB in the extended versions)Further 32 MB NAND Flash memory availabledata memory (static RAM)512 kB at 16 bits (296 kB BIOS; 216 kB application).parameter data memory13 kB at 16 bits (max limit: 400,000 writes per memory location) and further 32 kB of E2prom (not available to the pLAN)working cycle duration (medium complexity applications)0.2 s (typical)clock with battery standardclock precision 100 ppmbattery speci cations lithium button battery code CR2430 voltage 3 Vdc (dimensions 24x3 mm)Tab. 2.c The versions with valve driver, with or without Ultracap module, have the same number, type and con guration of I/Os as the Medium version.type ID1 to ID18 optically-isolated (contact live); B4, B5, B9, B10 not optically-isolated (voltage-free contact)maximum number of optically-isolated voltage inputs8: SMALL; 14: MEDIUM e EXTRALARGE; 18: LARGE. According to the combinations shown below:no. opto-isolated in. @ 24 Vac 50/60 Hz or 24 Vdcno. opto-isolated in. @ 24 Vac or 28-36 Vdc or 230 Vac (50/60 Hz)total inputsSMALL 8 none 8MEDIUM/ EXTRALARGE12 2 14LARGE 14 4 18minimum digital input impulse detection timeNormally open (open-closed-open) 200 msNormally closed (closed-open-closed) 400 msmaximum number of voltage-free contact inputs, not optically-isolated2: SMALL, MEDIUM and EXTRALARGE (B4 and B5);4: LARGE (B4, B5, B9, B10)Classi cation of measuring circuits (IEC EN 61010-1)Category I (J5, J7, J20) 24 Vac or 28 to 36 Vdc - Category III (J8, J19) 230 VacDigital input current draw, voltage-free (B4, B5, B9, B10)5 mADigital input current draw with 24 Vac voltage signal5 mADigital input current draw with 230 Vac voltage signal5 mATab. 2.d WARNINGS: IDH digital inputs at 230 Vac 50/60 Hz (10/-15%) protected by just one 500 mAT fuse; the two 230/24 Vac inputs on J8 and J12 have the same common pole and therefore both will be 24 Vac or 28 to 36Vdc, or 230 Vac. There is double insulation between the two inputs and the rest of the controller. for DC digital inputs (28 to 36 Vdc), either the + or the - can be connected to the common (IDC1). the rating of the external contact connected to the digital inputs must be at least 5 mA.Note: separate as much as possible the probe signal and digital input cables from the inductive load and power cables, to avoid possible electromagnetic disturbance.J21-5 ** NO16 normally open contact 16J21-6 ** C14 common for relays 14, 15, 16J22-1 ** C17 common for relays 17, 18, 19, 20J22-2 ** NO17 normally open contact 17J22-3 ** NO18 normally open contact 18J22-4 ** NO19 normally open contact 19J22-5 ** NO20 normally open contact 20J22-6 ** C17 common for relays 17, 18, 19, 20J23-1 Tx/Rx- Fieldbus 2 RS485 port - terminalJ23-2 Tx/Rx+ Fieldbus 2 RS485 port + terminalJ23-3 GND Fieldbus 2 RS485 port GND terminalJ24-1 +V term power supply to additional Aria terminalJ24-2 GND power supply commonJ24-3 +5 Vref power supply for 0 to 5V ratiometric probesJ25-1 Tx/Rx- BMS 2 RS485 port - terminalJ25-2 Tx/Rx+ BMS 2 RS485 port + terminalJ25-3 GND BMS 2 RS485 port GND terminalJ26-1 Tx/Rx- Fieldbus 2 RS485 port - terminalJ26-2 Tx/Rx+ Fieldbus 2 RS485 port + terminalJ27-3 GND Fieldbus 2 RS485 port GND terminalJ27-1 1 EXV valve 1 control (see Fig. 7cx)J27-2 2J27-3 3J27-4 4J28-1 1 EXV valve 2 control (see Fig. 7cx)J28-2 2J28-3 3J28-4 4J29-1 GND built-in EVD evo probe power supply commonJ29-2 VREF built-in EVD evo probe power supplyJ29-3 S1 built-in EVD evo probe 1J29-4 S2 built-in EVD evo probe 2J29-5 S3 built-in EVD evo probe 3J29-6 S4 built-in EVD evo probe 4J29-7 DI1 built-in EVD evo digital input 1J29-8 DI2 built-in EVD evo digital input 2J30-1 VBAT external valve power supply from Ultracap module (see inst. sheet +0500042IE)J30-2 G0J30-3 GTab. 2.a *: J19, J20, J21, J22 correspond to the LARGE model.**: J19, J20, J21, J22 correspond to the EXTRALARGE model.5dimensions SMALL version installable on 13 DIN modules, 110 x 227.5 x 60 mm;MEDIUM, LARGE and EXTRALARGE versions installable on 18 DIN modules, 110 x 315 x 60 mm;version with ULTRACAP MODULE installable only on the 18 module models with valve driver incorporated, 110 x 315 x 75 mmassembly DIN railTab. 2.b tted on DIN rail in accordance with DIN 43880 and IEC EN 50022; ammability: V2 (UL94) and 850 C (in accordance with IEC 60695); resistance to creeping current: 250 V;Page 1111ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Fast digital input speci cations (B4 and B5, voltage-free When con gured as fast digital inputs, B4 and B5 can measure a signal with a maximum frequency of 2 KHz and a resolution of 1 Hz. This is possible as the BIOS provides the application program two pairs of variables that count the zero crossing of the input signal and the corresponding frequency in Hz.analogue conversion 10 bit A/D converter CPU built-intype universal: (inputs B1, B2, B3, B6, B7, B8) CAREL NTC temperature sensor (-50T90 C; R/T 10 k at 25C), HT NTC0T150 C, voltage: 0 to 1 Vdc, 0 to 5 V ratiometric or 0 to 10 Vdc, current: 0 to 20 mA or 4 to 20 mA, selectable via software. Input resistance in 0 to 20 mA= 100passive: (inputs B4, B5, B9, B10) CAREL NTC temp. sensor (see universal), PT1000 (-100T200 C; R/T 1000 at 0C) or voltage-free digital input (5 mA), selectable via software;maximum number 5: SMALL; 8: MEDIUM e EXTRALARGE; 10: LARGEtime constant for each input0.5 sprecision 0.3 % of full scaleclassi cation of measuring circuits (IEC EN 61010-1)Category Iinput impedance NTC 10 K4 to 20 mA 100 0 to 1 V 100 K0 to 5 V 20 K0 to 10 V 12,7 KPT1000 10 KTab. 2.e WARNINGS: the 21 Vdc available at terminal +Vdc (J2) can be used to power any active probes; the maximum current is 150 mA, protected against short-circuits. It is not allowed to use temporary current values higher than 150 mA. To power the 0 to 5 Vdc ratiometric probes, use the +5VREF (Imax: 60 mA) available at terminal J24. Only use these voltages to power the active probes connected to pCO5type 0 to 10 Vdc optically-isolated on Y1, Y2, Y3, Y4, Y5 and Y6 / phase control on Y3 and Y4maximum number 4: SMALL, MEDIUM and EXTRALARGE ; 6: LARGEpower supply external 24 Vac or 28 to 36 Vdc on VG(+), VG0(-)resolution 8 bitmaximum load 1.5 k (7 mA)precision 2 % of full scale on outputs: Y1, Y2, Y3, Y4, Y5 and Y6Tab. 2.f WARNINGS: A 0 to 10 Vdc analogue output can be connected in parallel to other outputs of the same type, or alternatively to an external source of voltage. The higher voltage will be considered. Correct operation is not guaranteed if actuators with voltage inputs are connected. Power the VG-VG0 analogue outputs at the same voltage on G-G0: connect G to VG and G0 to VG0. This is valid for both alternating and direct current power supplies. For phase control outputs (PWM), note that synchronicity (zero crossing) is taken from G/G0 and only with 24 Vac power supply (not Vdc).Page 1212ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014type relaymaximum number8: SMALL; 13: MEDIUM; 18: LARGE; 29: EXTRALARGE Insulation distance The relay outputs have di erent features, depending on the model of pCO5. The outputs can be divided into groups. Between groups (cells in the table) there is double insulation and consequently these may have di erent voltages. There is also double insulation between each terminal of the digital outputs and the rest of the controller. The relays belonging to the same group (individual cell in the table) have basic insulation and therefore must have the same power supply (24 Vac or 230 Vac).Makeup of the groupsversion relays with same insulationgroup 1 group 2 group 3 group 4 group 5 group 6 group 7 group 8 group 9 group 10 group 11SMALLType of relay1 to 3 4 to 6 7 8 - - - - - - -Type A Type A Type A Type AMEDIUMType of relay1 to 3 4 to 6 7 8 9 to 11 12 13 - - - -Type A Type A Type A Type A Type ALARGEType of relay1 to 3 4 to 6 7 8 9 to 11 12 13 14 to 15 16 to 18 - -Type A Type A Type A Type A Type A Type A Type A Type AEXTRALARGE Type of relay1 to 3 4 to 6 7 8 9 to 11 12 13 14 to 16 17 to 20 21 to 24 25 to 29Type A Type A Type A Type A Type A Type A Type B Type B Type B Type BNOTE: the relays in the individual cells of the table have basic insulation, while there is double insulation between groups of cells.Changeover contacts 1: SMALL (relay 8); 3: MEDIUM and EXTRALARGE (relay 8, 12 and 13); 5: LARGE (relay 8, 12, 13, 14 and 15)Switchable power warning: the relay outputs have di erent features, depending on the model of pCO5type A relay type of relay: SPDT, 2000 VA, 250 Vac, 8 A resistivepCO5 approval: UL6030: 2A 250 Vac resistive, C300 pilot duty 240 Vac (30.000 cycles) EN 60730-1: 2 A resistive, 2 A inductive, cos= 0.6, 2(2) A (100.000 cycles)type B relay (EXTRALARGE models only)type of relay:: SPDT, 1250 VA, 250 Vac, 5 A resistive pCO5 approval: UL6030: 1A 250 Vac resistive, C300 pilot duty 240 Vac (30.000 cycles) EN 60730-1: 1 A resistive, 1 A inductive, cos= 0.6, 1(1) A (100.000 cycles)SSR outputs(optional on models where featured)1: SMALL (output 7); 2: MEDIUM and EXTRALARGE (outputs 7 and 12); 3 or 4: LARGE (outputs 7, 12 and 14 or 7, 12, 14 and 15)Working voltage: 24 Vac/Vdc; maximum load current = 0.5A; maximum impulsive load current = 1.2A.If the load requires higher current, use an external SSR.To power external loads, use the same power supply as the pCO (connected to terminals G/G0); as speci ed by Carel, this must always be dedicated and not in common with the power supply to other devices on the electrical panel (such as contactors, coils, etc.). Make sure that the load connection cables are as short as possible and away from power cables. Type of connector Pitch 5.08Rated voltage 250 VRated current 12 ACable size 0.25 mm2 - 2.5 mm2 (AWG: 24 to 12)Stripping length 7 mmScrew thread size M3Tightening torque 0.5-0.6 NmCable AWG and size cross-referenceAWG Size (mm2)Current5 pLAN BMS FieldBusNote: for details see paragraph 5.7type asynchronous half duplex RS485transmission speed 62.5 Kbps or 115.2 Kbps selectable via softwarepGD0, pGD1 terminal connector 6-pin telephone (J10)pLAN network/other terminal connector3-pin plug-in connector (J11)maximum number of units connectable32type of cable power supply distancepower supplytelephone10 m taken from pCO (150 mA)AWG24 shielded cable 200 m taken from pCO (150 mA)AWG20/22 shielded cable 500 m separate power supply via TCONN6J0005Note: J10 can only be connected to one terminal (pCOT, pCOI, pGD0, pGD1) Except PGD0 and PGD1 terminals, the other terminals should be The 21 Vdc available at +Vterm (J24) can be used to power an external Page 1313ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Manufacturer Compatible modelsCARELE*V****ALCOEX4; EX5; EX6; EX7; EX8 330 Hz (recommended by CAREL); EX8 500 Hz (from ALCO speci cations)SPORLAN SEI 0.5-11; SER 1.5-20; SEI 30; SEI 50; SEH 100; SEH175Danfoss ETS 12.5-25B; ETS 50B; ETS 100B; ETS 250; ETS 400CAREL Two CAREL EXVs connected togetherSPORLANSER(I) G, J, KPage 1414ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Motor connection shielded 4-wire cable CAREL code E2VCABS*00, or AWG22 shielded 4-wire cable Lmax =10 m, or AWG14 shielded 4-wire cable Lmax = 50 mDigital input connectionDigital input to be activated with voltage-free contact or transistor to GND. Closing current 5 mA; Maximum length < 10 mProbes maximum length 10 m or less than 30 m with shielded cableS1 ratiometric pressure probe (0 to 5 V) resolution 0.1 % FS measurement error: 2% FS maximum; 1% typicalelectronic pressure sensor (4 to 20 mA) resolution 0.5 % FS measurement error: 8% FS maximum; 7% typicalcombined ratiometric pressure probe (0 to 5 V) resolution 0.1 % FS measurement error: 2 % FS maximum; 1 % typical4 to 20 mA input (max. 24 mA) resolution 0.5 % FS measurement error: 8 % FS maximum; 7 % typicalS2 low temperature NTC 10 k at 25 C, -50T90 C measurement error: 1C in the range -50T50 C; 3 C in the range +50T90 Chigh temperature NTC 50 k at 25 C, -40T150 C measurement error: 1.5 C in the range -20T115 C, 4 C in range outside of -20T115 Ccombined NTC 0 k at 25 C, -40T120 C measurement error: 1C in the range -40T50 C; 3 C in the range +50T90 C0 to 10 V input (max 12 V) resolution 0.1% FS measurement error: 9% FS maximum; 8% typicalS3 ratiometric pressure probe (0 to 5 V): resolution 0.1 % FS measurement error: 2% FS maximum; 1% typicalelectronic pressure sensor (4 to 20 mA) resolution 0.5 % FS; measurement error: 8% FS maximum; 7% typicalcombined ratiometric pressure probe (0 to 5 V) resolution 0.1 % FS measurement error: 2 % FS maximum; 1 % typical4 to 20 mA input (max. 24 mA) resolution 0.5 % FS measurement error: 8 % FS maximum; 7 % typicalS4 low temperature NTC 10 k at 25 C, -50T105 C; measurement error: 1 C in the range -50T50 C; 3C in the range 50T90 Chigh temperature NTC 0 k at 25 C, -40T150 C measurement error: 1.5 C in the range -20T115 C; 4 C in range outside of -20T115 Ccombined NTC 10 k at 25 C, -40T120 C measurement error 1 C in the range -40T50 C; 3 C in the range +50T90 CPower to active probes (VREF)programmable output: +5 Vdc+/-2% or 12 Vdc+/-10%Emergency power supply optional Ultracapacitor module (PCOS00UC20 or EVD0000UC0). If the pCO5 operates constantly at temperatures near the upper limit of 60C its recommended to use the external module code EVD0000UC0, where possible located in the coolest point of the panel. The PCOS00UC20 and EVD0000UC0 modules can be connected at the same time to the same pCO5, thus doubling the energy available to close the valves. Important: The module only powers the valve driver and not the pCO5,J29J30GNDVREFS1S2S3S4DI1DI2J8ID13HID13IDC13ID14ID14HJ7ID9ID10ID11ID12ICC9J6B6B7B8GNDVBATG0GABCDLEDS5555pCO5 5 53storage conditions -40T70 C, 90% RH non-condensingoperating conditions -25T60 C, 90% RH non-condensingindex of protection IP20, IP40 on the front panel only (in the versions without Ultracap module)environmental pollution 2class according to protection against electric shockto be integrated into Class I and/or II appliancesPTI of the insulating materials PCB: PTI250; insulation material: PTI 175period of stress across the insulating partslongtype of action 1C; 1Y for versions a SSRtype of disconnection or microswitchingmicroswitchingcategory of resistance to heat and r ecategory D (UL94 - V2)immunity against voltage surges overvoltage category: II for all I/Os except for the high voltage digital outputs and digital inputs (class II circuits), which are category I ageing characteristics (operating hours)80,000no. of automatic operating cycles 100,000 (EN 60730-1); 30,000 (UL 873)software class and structure Class Acategory of immunity to voltage surges (IEC EN 61000-4-5)Category IIIThe device is not designed to be hand-held when poweredElectrical safetyEN 60730-1, EN 60730-2, UL60730Electromagnetic compatibilityVersions without valve driver: EN 61000-6-1, EN 61000-6-2, EN 61000-6-2/EC, EN 61000-6-2/IS1, EN 61000-6-3, EN 61000-6-4; EN 55014-1, EN 55014-2, EN 55014-2/EC, EN 55014-2/A1, EN 55014-2/IS1, EN 55014-2/A2Versions with valve driver with or without Ultracap module: EN 61000-6-1, EN 61000-6-2, EN 61000-6-2/EC, EN 61000-6-2/IS1, EN61000-6-3, EN 61000-6-4Page 1515ENGpCO5 +0300009EN rel. 1.2 - 24.04.201411045315604475 con modulo ultracap / with ultracap moduleFig. 2.f110456044Fig. 2.gPage 1616ENG1 32456111213J7J10J9J8J5J1GG0+5Vref+VDCID1GNDJ3C1NC1NO1J2SYNCB1B2B3B4B5B6GNDserial card 1J4J6TLANGNDC2NO2GNDY2Y1GNXISOLATEDTx/RxPWM 0/10VGNDTx/RxJ12GNDID2B7B8J11NO4NO5NO6NO7C3NO3C324 V (+10/-15%); 50/60 Hz48 V (36Vmin72 Vmax)input voltage: max. power:14 VA /11 W14GNDID2Y3Y40/10V 0/10VJ13NO3C3NO4J11NO6C5NO5J121516Fig. 2.hKey:5TYPE AJ2-3 B1 universal analogue input 1 (NTC, 0 to 1 V, 0 to 5 V, 0 to J2-3 B2 universal analogue input 2 (NTC, 0 to 1 V, 0 to 5 V, 0 to TX+ portTX+ portPage 1717ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014J8-3 GND GND connector for RS485 connection to Fieldbus portJ9-1 Y1 analogue output 1 PWM (for phase cutting speed controllers)J9-2 Y2 analogue output 2, 0 to 10 VJ9-3 GND analogue output referenceJ10-1 NO2 normally open contact, relay 2J10-2 C2 common for relay 2J11-1 C3 common for relays: 3, 4, 5, 6 ,7J11-2 NO3 normally open contact, relay 3J11-3 NO4 normally open contact, relay 4J11-4 NO5 normally open contact, relay 5J11-5 NO6 normally open contact, relay 6J11-6 NO7 normally open contact, relay 7J11-7 C3 common for relays: 3, 4, 5, 6 .7J12-7 GND reference for analogue input B7, B8 and digital input ID2J12-8 ID2 digital input 2J12-9 B7 universal analogue input 7 (NTC, DI)J12-12 B8 universal analogue input 8 (NTC, DI)TYPE BConnector Signal DescriptionJ1-1 G power supply, +24 Vdc or 24 to 48 VdcJ1-2 G0 power supply referenceJ2-1-2 SYNC power supply synchronicity input for phase controlJ2-3 B1 universal analogue input 1 (NTC, 0 to 1 V, 0 to 5 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA)J2-3 B2 universal analogue input 2 (NTC, 0 to 1 V, 0 to 5 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA)J2-5 B3 universal analogue input 3 (NTC, 0 to 1 V, PT1000)J2-6 B4 universal analogue input 4 (NTC, 0 to 1 V, PT1000)J2-7 B5 universal analogue input 5 (NTC, 0 to 1 V, 0 to 5 V, 0 to 10 V, DI)J2-8 B6 universal analogue input 6 (NTC, 0 to 1 V, 0 to 5 V, 0 to 10 V, DI)J2-9 GND analogue input referenceJ2-10 +5VREF power supply for 0 to 5 V ratiometric probesJ2-11 +24VDC power supply for 24 Vdc active probesJ2-12 ID1 digital input 1J2-13 GND reference for digital input ID1J13-1 C1 common for relays: 1J13-2 NC1 normally closed contact, relay 1J13-3 NO1 normally open contact, relay 1J4 6-pin telephone connector for connecting the standard user terminalJ5-1 RX-/TX- RX-/TX- connector for RS485 connection to the pLAN networkJ5-2 RX+/TX+ RX+/TX+ connector for RS485 connection to the pLAN networkJ5-3 GND reference for RS485 connection to the pLAN networkJ6 tLAN terminal connectorJ7-1 TLAN tLAN network connectorJ7-2 GND reference for connecting the tLAN networkJ8-1 RX-/TX- RX-/TX- connector for RS485 connection to Fieldbus portJ8-2 RX+/TX+ RX+/TX+ connector for RS485 connection to Fieldbus portJ8-3 GND GND connector for RS485 connection to Fieldbus portJ9-1 Y1 analogue output 1 PWM (for phase cutting speed controllers)J9-2 Y2 analogue output 2, 0 to 10 VJ9-3 GND analogue output referenceJ10-1 NO2 normally open contact, relay 2J10-2 C2 common for relay 2J11-1 NO4 normally open contact, relay 4J11-2 C3 common for relay 3, 4J11-3 NO3 normally open contact, relay 3J12-1 NO6 normally open contact, relay 6J12-2 C3 common for relay 5, 6J12-3 NO5 normally open contact, relay 5J13-1 GND reference for analogue output Y3, Y4 and digital input ID2J13-2 ID2 digital input 2J13-3 Y3 analogue output 3, 0 to 10 VJ13-4 Y4 analogue output 4, 0 to 10 VTab. 2.n5dimensionsall versions are available on 6 DIN modules 105x115x60 mmassemblyDIN railIsolated power supply DC power supply: 48 Vdc (36 Vmin to 72 Vmax) AC power supply: 24 Vac +10/-15 %, 50/60 HzMaximum power: P=11W, P=14VA, Imax=700mACPU H8SX/1651 32-bit, 50 MHzProgram memory (FLASH) 2+2 MByte Data memory (SRAM) 512 kBytes at 16 bit Parameter data memory (EEPROM)13 kBytes + 32 kB NAND Flash memory 32 MByteWorking cycle duration 0.2 s typical (medium complexity applications)Clock Available as standard and integrated into main boardTab. 2.o The battery used inside the pCO compact is a button sized lithium battery, code CR2430, 3 Vdc, dimensions 24mm x 3mm.SERIAL port speci cationsItem Type Reference Main featuresSerial ZEROPLAN J4, J5 Integrated on main board Not optically-isolated HW driver: RS485 Connectors: Telephone jack + 3-pin plug-in p. 3.81CABLE LENGTHConn. Type of shielded cableLmax (m)PowerJ4 Telephone 50 taken from pCO compact (150 mA)J4 AWG24 200 taken from pCO compact (150 mA)J4 AWG20/22 500 separate via TCONN6J000J5 AWG20/22 500 -Serial ONEBMS 1 Serial Card 1 Not integrated on main board HW driver: not present Can be used with all pCO family optional BMS cards Maximum cable length: see serial option documentsPage 1818ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Serial TWOOpto-isolated FIELD BusJ8 IIntegrated on main board Optically-isolated HW driver: RS485 opto-isolated 3-pin plug-in connector p. 3.81 Maximum AWG20/22 shielded cable length: 500 mtLAN J6/J7As an alternative to the Field Bus serial the following can be used: tLAN serial available on a 2-pin connector p. 3.81 (J7) or connection to a PLD terminal available via special 4-pin connector (J6) J7: maximum shielded cable length (2 wires + shield) AWG20/22: 30 m J6: maximum four-wire cable length (see accessories table): 2 m for domestic environments, 10 m for residential environmentsTab. 2.p Note:connected to PE.compacts connected as SLAVES cannot be connected using serial 2. Nonetheless, only one SLAVE can be connected using serial 2.Type Asynchronous half duplex RS485Transmission speed62.5 Kbps or 115.2 Kbps selectable via softwareMaximum number of units connectable32 Unit maximum allowedTerminal connector6-pin telephone (J4)Connector pLAN network, graphic terminal, Aria terminal3-pin plug-in connector, 3.81 mm pitch (J5)Maximum network length30 mTab. 2.q Note:terminals however without using the display backlighting.supplies.Type Asynchronous half duplex 0/5 Vdc, non-di erential Transmission speed 9.6 Kbps or 19.2 Kbps selectable via softwareMaximum number of units connectableMaximum 5 units allowedtLAN network connector 2-pin plug-in connector, 3.81 mm pitch (J7)Tab. 2.r Note:serial available on the 3-pin connector p. 5.08 (J8) or the PLD terminal connection available on the special 4-pin connector (J6).Max. cable length 10 mAnalogue conversion A/D converter, 10-bit CPU built-in Models TYPE A TYPE BCAREL NTC -50T90 C; R/T 10 k at 25C or HT NTC0T150 CB1, B2, B3, B4, B5, B6, B7, B8B1, B2, B3, B4, B5, B60 to 1 Vdc voltage B1, B2, B3, B4, B5, B6B1, B2, B5, B6B1, B2, B5, B6B1, B2B3, B40 to 5 Vdc ratiometric0 to 10 Vdc voltage0 to 20 mA or 4 to 20 mA currentPT1000 -100T200 C; R/T 1000 at 0 CVoltage-free digital input (5 mA) B5, B6, B7, B8 B5, B6Total 8 6Tab. 2.s Warning: for the power supply to any active probes, the +21 V available on the +21VDC terminal can be used, maximum current available Imax=60 mA, protected against short-circuits. For the power supply to the 0 to 5 Vdc ratiometric probes, use the +5 VREF, maximum current available Imax= 60 mA, protected against short-circuits.Time constant 0.5 sPrecision 0.3% of full scaleClassi cation of measuring circuits Category I (IEC EN 61010-1)Tab. 2.t Warning: separate as much as possible the probe signal and digital input cables from the inductive load and power cables, to avoid possible electromagnetic disturbance.Max. cable length 10 mType Not opto-isolated, voltage-free contactPower supply InternalModels TYPE A TYPE BMultifunction analogue inputs (see note) B5, B6, B7, B8 B5, B6Fast digital input ID1 ID1Normal digital input ID2 ID2Total 6 4Tab. 2.u Note:Multifunction analogue inputs: these analogue inputs can be programmed via software as digital inputs instead of analogue inputs. All digital inputs refer to GND.Fast digital input speci cations (ID1) The fast digital input (ID1) can be con gured via software in two di erent operating modes, with the following characteristics:When con gured as a fast digital input, ID1 can measure a signal with a maximum frequency of 2 KHz, resolution +/- 1 Hz. This is made possible by the BIOS, which provides the SW application with two variables that the count the number of times the input signal crosses zero and the corresponding frequency in Hz.Normal and fast digital input speci cationsThe maximum current available to the digital input is 5 mA (consequently the rating of the external contact must be at least 5 mA).Max. cable length 10 mPage 1919ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Type Not opto-isolatedPower supply InternalModels TYPE A TYPE B0 to 10 Vdc analogue output Y2 Y2, Y3, Y4PWM analogue output with 5 Vdc pulse of programmable durationY1 Y1Total 2 4Tab. 2.v Resolution 8 bitPrecision 2% of full scale on Y2Settling time 2sMaximum load 1k (10 mA) for Y2 0/10V, 470 (10 mA) for Y1 PWMTab. 2.w Technical speci cations of the outputsInsulation groupConn. ModelsType AType A (2 SSR)Type BType B (2 SSR)Type B (4 SSR)SPDT relay:UL873: 2.5 A resistive, 2 A FLA, 12 A LRA, 250 Vac, C300 pilot duty (30,000 cycles) EN60730-1: 2 A resistive, 2 A inductive, cos(phi)=0.6, 2 (2) A (100,000 cycles)1 J3 1-1-12 J10 1-1-1SPST relay:UL873: 1 A resistive, 1 A FLA, 6 A LRA, 250 Vac, D300 pilot duty (30,000 cycles) EN60730-1: 1 A resistive, 1 A inductive, cos(phi)=0.6, 1 (1) A (100,000 cycles)3 J11 5522-4 J12 - - 2 2 -Power MOSFET Photovoltaic relayOperating voltage: 24 Vac or 28 to 36 VdcMaximum power: 10 W1 J3 -1-1-2 J10 -1-1-3 J11 ----24 J12 ----2Total outputs 77666Tab. 2.x pCO5 5560105110J7J10J9J8J5J1GG0+5Vref+VDCID1GNDJ3C1NC1NO1J2SYNCB1B2B3B4B5B6GNDserial card 2serial card 1J4J6TLANGNDC2NO2GNDY2Y1GNXISOLATEDTx/RxPWM 0/10VGNDTx/Rx24 V (+10/-15%); 50/60 Hz48 V (36Vmin72 Vmax)input voltage: max. power:8 VA / 6 WPage 2020ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Various types of user terminals are available, di ering in terms of:The pGD graphic display is an electronic device, compatible with the previous PCOI/PCOT terminals, used for the complete management of the graphics, by displaying icons (de ned at an application software development level) and international fonts, in two dimensions: 5x7 and 11x15 pixels. The application software only resides on the pCO board; the terminal does not need any additional software during operation. In addition, the terminal allows a wide range of operating temperatures (-20T60C) and guarantees a high index of protection (IP65).Fig. 3.aWhite Backlight White Backlight with buzzerBuilt-in or panel versionPGDE000F00 PGDE000FZ0Wall-mounted version PGDE000W00 PGDE000WZ0Tab. 3.aDisplayType: FSTN graphic Backlighting: white LEDs (controlled by application program) depending on the code.Graphic resolution: 132x64 pixelText modes: 8 rows x 22 columns (5x7 and 11x15 pixel fonts)4 rows x 11 columns (11x15 pixel fonts)or mixed modesCharacter height: 3.5 mm (5x7 pixel fonts)7.5 mm (11x15 pixel fonts)Size of the active area: 72x36 mmKeypad LED / buzzer2 programmable from application program, red and orange (+ buttons)4 4 green controlled by LCD backlighting LCD (& buttons) Optional buzzer (*Z0 models)Power supplyVoltage: power supply from pCO via telephone connector or from external 18/30 Vdc source protected by external 250 mAT fuseMaximum power input: 0.8 WTab. 3.bPGD1000I00 pCO graphic display (panel installation)Fig. 3.bDisplayType: FSTN graphic Backlighting: green LEDs (controlled by application program) depending on the code..Graphic resolution: 132x64 pixelText modes: 8 rows x 22 columns (5x7 and 11x15 pixel fonts)4 rows x 11 columns (11x15 pixel fonts)or mixed modesCharacter height: 3.5 mm (5x7 pixel fonts)7.5 mm (11x15 pixel fonts)Size of the active area: 66x32 mmSize of the display area: 72x36 mmKeypad15 buttons, the ESC button is replaced by the MENU buttonPower supplyVoltage: power supply from pCO via telephone connector or from external 18/30 Vdc source protected by external 250 mAT fuseMaximum power input: 1.8 WTab. 3.cAdjusting contrast on the pGD1:1. pressing the Alarm and Prg buttons together2. holding the two buttons, use Up or Down to adjust the contrast as desired (increase or decrease).Fig. 3.cFig. 3.dPage 2121ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014pCO5 and pCO5 compact come in the built-in terminal version with the display and keypad directly incorporated onto the plastic case.codes PCO5******E**,PCO5******F**,PCO5******G**,LCD 8x22, backlit (pGD1)number of buttons 6number of LEDs 4+2 two-colourTab. 3.dThese versions with integrated LCD and keypad also support connection to the pCO, PGDE and PGD1 series terminals (the two displays, built-in and standard, work at the same time, displaying the same information).The display contrast can also be adjusted on this version of terminal.To do this :desired (increase or decrease).The typical connection between the pGD terminal and the pCO is made using a 6-wire telephone cable supplied by CAREL (code S90CONN00*, see the table). To make the connection, simply plug the cable into the 6-pin connector on the pCO board (J10 for pCO3

0/10VGNDTx/RxJ12GNDID2B7B8J11NO4NO5NO6NO7C3NO3C324 V (+10/-15%); 50/60 Hz48 V (36Vmin72 Vmax)input voltage: max. power:14 VA /11 W14GNDID2Y3Y40/10V 0/10VJ13NO3C3NO4J11NO6C5NO5J121516Fig. 2.hKey:5TYPE AJ2-3 B1 universal analogue input 1 (NTC, 0 to 1 V, 0 to 5 V, 0 to J2-3 B2 universal analogue input 2 (NTC, 0 to 1 V, 0 to 5 V, 0 to TX+ portTX+ portPage 1717ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014J8-3 GND GND connector for RS485 connection to Fieldbus portJ9-1 Y1 analogue output 1 PWM (for phase cutting speed controllers)J9-2 Y2 analogue output 2, 0 to 10 VJ9-3 GND analogue output referenceJ10-1 NO2 normally open contact, relay 2J10-2 C2 common for relay 2J11-1 C3 common for relays: 3, 4, 5, 6 ,7J11-2 NO3 normally open contact, relay 3J11-3 NO4 normally open contact, relay 4J11-4 NO5 normally open contact, relay 5J11-5 NO6 normally open contact, relay 6J11-6 NO7 normally open contact, relay 7J11-7 C3 common for relays: 3, 4, 5, 6 .7J12-7 GND reference for analogue input B7, B8 and digital input ID2J12-8 ID2 digital input 2J12-9 B7 universal analogue input 7 (NTC, DI)J12-12 B8 universal analogue input 8 (NTC, DI)TYPE BConnector Signal DescriptionJ1-1 G power supply, +24 Vdc or 24 to 48 VdcJ1-2 G0 power supply referenceJ2-1-2 SYNC power supply synchronicity input for phase controlJ2-3 B1 universal analogue input 1 (NTC, 0 to 1 V, 0 to 5 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA)J2-3 B2 universal analogue input 2 (NTC, 0 to 1 V, 0 to 5 V, 0 to 10 V, 0 to 20 mA, 4 to 20 mA)J2-5 B3 universal analogue input 3 (NTC, 0 to 1 V, PT1000)J2-6 B4 universal analogue input 4 (NTC, 0 to 1 V, PT1000)J2-7 B5 universal analogue input 5 (NTC, 0 to 1 V, 0 to 5 V, 0 to 10 V, DI)J2-8 B6 universal analogue input 6 (NTC, 0 to 1 V, 0 to 5 V, 0 to 10 V, DI)J2-9 GND analogue output referenceJ2-10 +5VREF power supply for 0 to 5 V ratiometric probesJ2-11 +24VDC power supply for 24 Vdc active probesJ2-12 ID1 digital input 1J2-13 GND reference for digital input ID1J13-1 C1 common for relays: 1J13-2 NC1 normally closed contact, relay 1J13-3 NO1 normally open contact, relay 1J4 6-pin telephone connector for connecting the standard user terminalJ5-1 RX-/TX- RX-/TX- connector for RS485 connection to the pLAN networkJ5-2 RX+/TX+ RX+/TX+ connector for RS485 connection to the pLAN networkJ5-3 GND reference for RS485 connection to the pLAN networkJ6 tLAN terminal connectorJ7-1 TLAN tLAN network connectorJ7-2 GND reference for connecting the tLAN networkJ8-1 RX-/TX- RX-/TX- connector for RS485 connection to Fieldbus portJ8-2 RX+/TX+ RX+/TX+ connector for RS485 connection to Fieldbus portJ8-3 GND GND connector for RS485 connection to Fieldbus portJ9-1 Y1 analogue output 1 PWM (for phase cutting speed controllers)J9-2 Y2 analogue output 2, 0 to 10 VJ9-3 GND analogue output referenceJ10-1 NO2 normally open contact, relay 2J10-2 C2 common for relay 2J11-1 NO4 normally open contact, relay 4J11-2 C3 common for relay 3, 4J11-3 NO3 normally open contact, relay 3J12-1 NO6 normally open contact, relay 6J12-2 C3 common for relay 5, 6J12-3 NO5 normally open contact, relay 5J13-1 GND reference for analogue output Y3, Y4 and digital input ID2J13-2 ID2 digital input 2J13-3 Y3 analogue output 3, 0 to 10 VJ13-4 Y4 analogue output 4, 0 to 10 VTab. 2.n5dimensionsall versions are available on 6 DIN modules 105x115x60 mmassemblyDIN railIsolated power supply DC power supply: 48 Vdc (36 Vmin to 72 Vmax) AC power supply: 24 Vac +10/-15 %, 50/60 HzMaximum power: P=11W, P=14VA, Imax=700mACPU H8SX/1651 32-bit, 50 MHzProgram memory (FLASH) 2+2 MByte Data memory (SRAM) 512 kBytes at 16 bit Parameter data memory (EEPROM)13 kBytes + 32 kB NAND Flash memory 32 MByteWorking cycle duration 0.2 s typical (medium complexity applications)Clock Available as standard and integrated into main boardTab. 2.o The battery used inside the pCO compact is a button sized lithium battery, code CR2430, 3 Vdc, dimensions 24mm x 3mm.SERIAL port speci cationsItem Type Reference Main featuresSerial ZEROPLAN J4, J5 Integrated on main board Not optically-isolated HW driver: RS485 Connectors: Telephone jack + 3-pin plug-in p. 3.81CABLE LENGTHConn. Type of shielded cableLmax (m)PowerJ4 Telephone 50 taken from pCO compact (150 mA)J4 AWG24 200 taken from pCO compact (150 mA)J4 AWG20/22 500 separate via TCONN6J000J5 AWG20/22 500 -Serial ONEBMS 1 Serial Card 1 Not integrated on main board HW driver: not present Can be used with all pCO family optional BMS cards Maximum cable length: see serial option documentsPage 1818ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Serial TWOOpto-isolated FIELD BusJ8 IIntegrated on main board Optically-isolated HW driver: RS485 opto-isolated 3-pin plug-in connector p. 3.81 Maximum AWG20/22 shielded cable length: 500 mtLAN J6/J7As an alternative to the Field Bus serial the following can be used: tLAN serial available on a 2-pin connector p. 3.81 (J7) or connection to a PLD terminal available via special 4-pin connector (J6) J7: maximum shielded cable length (2 wires + shield) AWG20/22: 30 m J6: maximum four-wire cable length (see accessories table): 2 m for domestic environments, 10 m for residential environmentsTab. 2.p Note:connected to PE.compacts connected as SLAVES cannot be connected using serial 2. Nonetheless, only one SLAVE can be connected using serial 2.Type Asynchronous half duplex RS485Transmission speed62.5 Kbps or 115.2 Kbps selectable via softwareMaximum number of units connectable32 Unit maximum allowedTerminal connector6-pin telephone (J4)Connector pLAN network, graphic terminal, Aria terminal3-pin plug-in connector, 3.81 mm pitch (J5)Maximum network length30 mTab. 2.q Note:terminals however without using the display backlighting.supplies.Type Asynchronous half duplex 0/5 Vdc, non-di erential Transmission speed 9.6 Kbps or 19.2 Kbps selectable via softwareMaximum number of units connectableMaximum 5 units allowedtLAN network connector 2-pin plug-in connector, 3.81 mm pitch (J7)Tab. 2.r Note:serial available on the 3-pin connector p. 5.08 (J8) or the PLD terminal connection available on the special 4-pin connector (J6).Max. cable length 10 mAnalogue conversion A/D converter, 10-bit CPU built-in Models TYPE A TYPE BCAREL NTC -50T90 C; R/T 10 k at 25C or HT NTC0T150 CB1, B2, B3, B4, B5, B6, B7, B8B1, B2, B3, B4, B5, B60 to 1 Vdc voltage B1, B2, B3, B4, B5, B6B1, B2, B5, B6B1, B2, B5, B6B1, B2B3, B40 to 5 Vdc ratiometric0 to 10 Vdc voltage0 to 20 mA or 4 to 20 mA currentPT1000 -100T200 C; R/T 1000 at 0 CVoltage-free digital input (5 mA) B5, B6, B7, B8 B5, B6Total 8 6Tab. 2.s Warning: for the power supply to any active probes, the +21 V available on the +21VDC terminal can be used, maximum current available Imax=60 mA, protected against short-circuits. For the power supply to the 0 to 5 Vdc ratiometric probes, use the +5 VREF, maximum current available Imax= 60 mA, protected against short-circuits.Time constant 0.5 sPrecision 0.3% of full scaleClassi cation of measuring circuits Category I (IEC EN 61010-1)Tab. 2.t Warning: separate as much as possible the probe signal and digital input cables from the inductive load and power cables, to avoid possible electromagnetic disturbance.Max. cable length 10 mType Not opto-isolated, voltage-free contactPower supply InternalModels TYPE A TYPE BMultifunction analogue inputs (see note) B5, B6, B7, B8 B5, B6Fast digital input ID1 ID1Normal digital input ID2 ID2Total 6 4Tab. 2.u Note:Multifunction analogue inputs: these analogue inputs can be programmed via software as digital inputs instead of analogue inputs. All digital inputs refer to GND.Fast digital input speci cations (ID1) The fast digital input (ID1) can be con gured via software in two di erent operating modes, with the following characteristics:When con gured as a fast digital input, ID1 can measure a signal with a maximum frequency of 2 KHz, resolution +/- 1 Hz. This is made possible by the BIOS, which provides the SW application with two variables that the count the number of times the input signal crosses zero and the corresponding frequency in Hz.Normal and fast digital input speci cationsThe maximum current available to the digital input is 5 mA (consequently the rating of the external contact must be at least 5 mA).Max. cable length 10 mPage 1919ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Type Not opto-isolatedPower supply InternalModels TYPE A TYPE B0 to 10 Vdc analogue output Y2 Y2, Y3, Y4PWM analogue output with 5 Vdc pulse of programmable durationY1 Y1Total 2 4Tab. 2.v Resolution 8 bitPrecision 2% of full scale on Y2Settling time 2sMaximum load 1k (10 mA) for Y2 0/10V, 470 (10 mA) for Y1 PWMTab. 2.w Technical speci cations of the outputsInsulation groupConn. ModelsType AType A (2 SSR)Type BType B (2 SSR)Type B (4 SSR)SPDT relay:UL873: 2.5 A resistive, 2 A FLA, 12 A LRA, 250 Vac, C300 pilot duty (30,000 cycles) EN60730-1: 2 A resistive, 2 A inductive, cos(phi)=0.6, 2 (2) A (100,000 cycles)1 J3 1-1-12 J10 1-1-1SPST relay:UL873: 1 A resistive, 1 A FLA, 6 A LRA, 250 Vac, D300 pilot duty (30,000 cycles) EN60730-1: 1 A resistive, 1 A inductive, cos(phi)=0.6, 1 (1) A (100,000 cycles)3 J11 5522-4 J12 - - 2 2 -Power MOSFET Photovoltaic relayOperating voltage: 24 Vac or 28 to 36 VdcMaximum power: 10 W1 J3 -1-1-2 J10 -1-1-3 J11 ----24 J12 ----2Total outputs 77666Tab. 2.x pCO5 5560105110J7J10J9J8J5J1GG0+5Vref+VDCID1GNDJ3C1NC1NO1J2SYNCB1B2B3B4B5B6GNDserial card 2serial card 1J4J6TLANGNDC2NO2GNDY2Y1GNXISOLATEDTx/RxPWM 0/10VGNDTx/Rx24 V (+10/-15%); 50/60 Hz48 V (36Vmin72 Vmax)input voltage: max. power:8 VA / 6 WPage 2020ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Various types of user terminals are available, di ering in terms of:The pGD graphic display is an electronic device, compatible with the previous PCOI/PCOT terminals, used for the complete management of the graphics, by displaying icons (de ned at an application software development level) and international fonts, in two dimensions: 5x7 and 11x15 pixels. The application software only resides on the pCO board; the terminal does not need any additional software during operation. In addition, the terminal allows a wide range of operating temperatures (-20T60C) and guarantees a high index of protection (IP65).Fig. 3.aWhite Backlight White Backlight with buzzerBuilt-in or panel versionPGDE000F00 PGDE000FZ0Wall-mounted version PGDE000W00 PGDE000WZ0Tab. 3.aDisplayType: FSTN graphic Backlighting: white LEDs (controlled by application program) depending on the code.Graphic resolution: 132x64 pixelText modes: 8 rows x 22 columns (5x7 and 11x15 pixel fonts)4 rows x 11 columns (11x15 pixel fonts)or mixed modesCharacter height: 3.5 mm (5x7 pixel fonts)7.5 mm (11x15 pixel fonts)Size of the active area: 72x36 mmKeypad LED / buzzer2 programmable from application program, red and orange (+ buttons)4 4 green controlled by LCD backlighting LCD (& buttons) Optional buzzer (*Z0 models)Power supplyVoltage: power supply from pCO via telephone connector or from external 18/30 Vdc source protected by external 250 mAT fuseMaximum power input: 0.8 WTab. 3.bPGD1000I00 pCO graphic display (panel installation)Fig. 3.bDisplayType: FSTN graphic Backlighting: green LEDs (controlled by application program) depending on the code..Graphic resolution: 132x64 pixelText modes: 8 rows x 22 columns (5x7 and 11x15 pixel fonts)4 rows x 11 columns (11x15 pixel fonts)or mixed modesCharacter height: 3.5 mm (5x7 pixel fonts)7.5 mm (11x15 pixel fonts)Size of the active area: 66x32 mmSize of the display area: 72x36 mmKeypad15 buttons, the ESC button is replaced by the MENU buttonPower supplyVoltage: power supply from pCO via telephone connector or from external 18/30 Vdc source protected by external 250 mAT fuseMaximum power input: 1.8 WTab. 3.cAdjusting contrast on the pGD1:1. pressing the Alarm and Prg buttons together2. holding the two buttons, use Up or Down to adjust the contrast as desired (increase or decrease).Fig. 3.cFig. 3.dPage 2121ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014pCO5 and pCO5 compact come in the built-in terminal version with the display and keypad directly incorporated onto the plastic case.codes PCO5******E**,PCO5******F**,PCO5******G**,LCD 8x22, backlit (pGD1)number of buttons 6number of LEDs 4+2 two-colourTab. 3.dThese versions with integrated LCD and keypad also support connection to the pCO, PGDE and PGD1 series terminals (the two displays, built-in and standard, work at the same time, displaying the same information).The display contrast can also be adjusted on this version of terminal.To do this :desired (increase or decrease).The typical connection between the pGD terminal and the pCO is made using a 6-wire telephone cable supplied by CAREL (code S90CONN00*, see the table). To make the connection, simply plug the cable into the 6-pin connector on the pCO board (J10 for pCO3 and pCO1, J5 for pCOXS, J19 pCOC), until it clicks into place. To remove the connector, lightly press the plastic catch and remove the cable. The telephone connector provides both the data link and the power supply to the terminal, and is the simplest connection method; in more complex con gurations, where multiple terminals need to be connected to the pCO or to cover lengths over 50 m, use shielded, twisted pair cable (see diagrams in chap. 5). Warning shielded cables must be used even when the pCO is tted on appliances for household or similar uses, and therefore subject to the requirements of IEC EN 55014-1 of 04/98) (see paragraph 5.7). When making a pLAN network of pCO controllers and terminals, remember that one pCO can only power one pGD0/1 or pCOT/I terminal. If needing to manage more than one terminal or for the pGD2/3, an independent power supply is required (see diagrams in chap. 5). The direct current available at Vterm (J24 for pCO3, J9 for pCO1) can power an Aria or PLD terminal with a maximum current of 2 W. Absence of the terminal does not compromise operation of the pCO.RS485: PCOS004850Fig. 3.e The PCOS004850 card is an option used to interface pCO electronic controllers to an RS485 network with maximum baud rate 19200 baud (settable via software). It guarantees optical isolation of the controller from the RS485 serial network. For the technical speci cations, meanings of the connections (pins) and instructions on inserting the card, see the instructions shown on the instruction sheet included in the packaging with the card (code +050003237).RS232 serial card for modem management: PCO100MDM0Fig. 3.f The PCO100MDM0 card is an option used to interface pCO electronic controllers to a standard HAYES modem, managing the following hardware signals:(DTR);The maximum baud rate is 19200 baud. For the technical speci cations, meanings of the connections (pins) and instructions on inserting the card, see the instructions shown on the instruction sheet included in the packaging with the card (code +050003240).Ethernet serial card: PCO1000WB0Fig. 3.g Used to interface pCO controllers with BACnet Ethernet and IP, SNMP V1, 2, FTP and HTTP, Modbus TCP/IP protocols..BACnet MSTP RS485 interface card (PCO1000BA0)Fig. 3.h Used to interface pCO controllers with the BACnet MSTP protocol, increasingly used for HVAC applications.CANbus serial card: PCOS00HBB0Fig. 3.i These devices are used to connect pCO controllers to CANbus networks and, more speci cally, to e-drofan fan coil controllers, exploiting the power of the edronic system to allow simpler management of the installation, optimising comfort, synergies between controllers and running costs. For the technical speci cations, meanings of the connections (pins) and instructions on inserting the card, see the instructions shown on the instruction sheet included in the packaging with the card (code Page 22Page 23Page 2424ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014pCO./ UP /DOWNFlashing: the key is connecting to the pCO, during this phase, which may last a few seconds, the start button is disabled.START Flashing: the key has detected the pCO and is checking the access rightsSTART+On steady: pressing the button starts writing the software to the pCOSTART+On steady: pressing the button starts reading the software from the pCOSTART+On steady: pressing the button starts reading the logs from the pCOMODE On steady: for key type C, pressed for 1 second switches from read to write+ +symbols ashing Communication error: no response from the pCO Firmware version of the key incompatible+MODEsymbols on steady Password error+MODEsymbols ashing Type of key incompatible+symbols on steady The key is missing one or more required les Empty memory: no kit for the type of pCO connected+ +STARTsymbols on steady + ashing STARTIncompatibility between the software on the key and the pCO HW (*)+ +MODEsymbols on steady + ashing MODEIncompatibility between pCO application and HW (application size)+ +symbols on steady No logged data present on the pCOsymbol on steady Type of key not programmed+START++BUZZERsymbols ashing and buzzer sounding intermittentlyThe write operation has failed+START++BUZZERsymbols ashing and buzzer sounding intermittentlyThe read operation has failed+START++BUZZERsymbols ashing and buzzer sounding intermittentlyThe read logs operation has failed+ + symbols on steady + ashingIncompatibility between log con guration and pCO HW (no dedicated ash memory)+symbols on steady Insu cient space to read logged datasymbol ashing Generic errorPage 2525ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014Type Function Mode buttonB Update software from key to pCO (bios, application, parameters,)DisabledC* Copy software from pCO to pCO (bios, application, parameters,)Switches the key from write mode to read modeD Read logged data DisabledE Read logged data and software from pCO (bios, application, parameters,)DisabledF Read logged data from Chiller3 DisabledG Copy from pCO to pCO and read logged dataSwitches the key from write mode to read mode*: Default modeTab. 3.hpCOePCO3CON * * 00= screw1= springS= smallM= mediumL= largeZ= extra large N.O.Tab. 3.a PCOXCON * * 00= screw1= springA= type AB= type BTab. 3.i Page 2626ENGpCO5 +0300009EN rel. 1.2 - 24.04.2014 Environmental conditionsAvoid assembling the pCO and the terminal in rooms with the following characteristics.data of the product;ammonia fumes, saline mist, smoke) so as to avoid corrosion and/or oxidation;installing the units near transmitting antennae);present;and reduction of insulation).Positioning inside the panelThe position of the controller in the electrical cabinet must be chosen so as to guarantee correct physical separation from the power components (solenoids, contactors, actuators, inverters, ...) and the connected cables. Proximity to such devices/cables may create random malfunctions that are not immediately evident.The structure of the panel must allow the correct ow of cooling air.When laying the wiring, physically separate the power part from the control part. The proximity of these two sets of wires will, in most cases, cause problems of induced disturbance or, over time, malfunctions or damage to the components. The ideal solution is to house these two circuits in two separate cabinets. Sometimes this is not possible, and therefore the power part and the control part must be installed in two separate areas inside the same panel. For the control signals, it is recommended to use shielded cables with twisted wires.If the control cables have to cross over the power cables, the intersections must be as near as possible to 90 degrees, always avoiding running the control cables parallel to the power cables.Carel highlights the following warnings:each screw and insert the cable ends, then tighten the screws. When the operation is completed, slightly tug the cables to check they are su ciently tight;line cables from the cables carrying inductive loads and power cables to avoid possible electromagnetic disturbance. Never insert power cables (including the electrical cables) and probe signal cables in the same conduits. Do not install the sensor cables in the immediate vicinity of power devices (contactors, circuit breakers or similar);spiral paths that enclose power devices;on the boards to avoid electrostatic discharges (extremely damaging) from the operator to the components;wire corresponds to the wire that runs to the controller and enters terminal G0; this applies to all the devices connected to the pCO;with excessive force, to avoid damaging the pCO;10/55 Hz), secure the cables connected to the pCO around 3 cm from the connectors using clamps;61000-6-2) the connections must be less than 30 m long;28 to 36 Vdc digital inputs, analogue outputs, serial bus connections, power supplies) must have reinforced or double insulation from the mains network;and the terminal must be shielded;individual terminal. The only limitation concerns the maximum current crossing each terminal: this must not exceed 8 A;AWG);terminal (torque tightening) is 0.6 Nm; Warningslegislation in force in the country where the device is used;panel, so that the only accessible part is the display and the keypad;rather contact CAREL.The pCO is installed on a DIN rail. To fasten the unit to the DIN rail, press it lightly against the rail. The rear tabs will click into place, locking the unit in place. Removing the unit is just as simple, using a screwdriver through the release slot to lever and lift the tabs. These are kept in the locked position by springs.pCO5 power supply (controller with terminal connected)28 to 36 Vdc +10/-20% and 24 Vac +10/-15% 50 to 60 Hz;Maximum current P= 20 W (power supply Vdc), P= 45 VA (Vac)pCO5 compact power supply: 48 Vdc (36 Vmin to 72 Vmax) and 24 Vac +10/-15 %, 50/60 HzMaximum current P=11W, P=14VA, Imax=700mATab. 4.a the system;to supply just one pCO5 controller; the pCO5 compact on the other requires the same type of transformer yet with a 25 VA rating.controllers and terminals) should be separated from the power supply to the other electrical devices (contactors and other electromechanical components) inside the electrical panel;wire is connected to terminal G0. This applies to all the devices connected to the pCO; that the G and G0 references are observed (G0 must be maintained for all boards);

Carel pco password. Carel easy controller parameters. Carel pco5 password. Password for carel controller. Carel pco5 handleiding. Carel pco5 programming. Carel easy controller password. Carel controller default password. Carel pco5+ manual.