IC 7685

Ion Concentration controller

Applications

- with ISE electrodes
- water softeners
- drinking water
- electroplating industry
- Aluminum surface coating
- CO_2 in biotechnology

Input from any ISE and CO2 electrodes
Input form Pt100 3 wires

Measuring unit: PPM - mg/l - gr/l - mbar - mmHg
Measuring range from 0.01 to 1000
Autoranging
Up to 5 points calibration

Temperature readout
Calibration parameters display
Dual set-point and alarm conditions display
Automatic or manual temperature compensation
Dual filter software

Isolated output:

- 0/20 mA or 4/20 mA selectable
- programmable input on the span
- dual output as option

Automatic or manual operation
Dual set-point with hysteresis, delay, and min/max programmable functions

Alarm:

- continuous/flashing
- min/max and delay programmable
- on set-points timing

EEPROM parameters storage
Automatic overload protection and reset
Extractable terminal blocks
96X96 (1/4" DIN) housing

Accessories

This instrument may use all the ISE sensors for continuous operation.

Technical Specifications

in addition to those common in the series 7685

Operating mode
Automatic/manual

ISE input
* Ion type X- -, X-, X+, X++
Measuring scales: 5 decades from 0.01 to 1000

*** Scales**
10.00 - 100.0 - 1000 autoranging
Software filter 90%RT: 0.4/20.00 s for small/large variations

Calibration
Up to 5 points over all the measuring range
Zero adjustment: ± 100.0 mV
Range: ± 1100 mV

Temperature
Input: RTD Pt100 3 wires
Measuring range:-10.0/110.0 °C
Resolution: ± 0.1 °C
Zero: ± 2 °C
Manual Temperature: -10/110 °C

Temperature compensation
Selectable: able/disable
Compensation range: -10/110 °C
Reference Temperature: 20 °C

Option
091.4143 9/36 VDC power supply

B&C electronics

7685 Series microprocessor-based

General information

The **7685 Series** includes all of the most complete and most performing analyzers of B&C Electronics.
They include all of the following measures:

- **pH - ORP**
- **Conductivity - Resistivity**
- **Free residual chlorine, combined and total**
- **Residual chlorine dioxide**
- **Residual dissolved ozone**
- **Dissolved oxygen**
- **Turbidity and Suspended Solids**
- **Residual dissolved Sulfide/Sulfite**
- **ISE**

All controllers are manufactured in robust aluminum enclosures DIN 43700, with front panels in polycarbonate.
Their reliability and precision, along with their functionality, make them easy to use in all applications. Finally, 7685 Series guarantees one of the best performance-price ratio in the marketplace.

Common features

Selectable input
Input from RTD Pt100 3 wires
Temperature readout
Dual filter software
Operating mode: automatic and manual
Calibration parameters display
Set-point and alarm conditions display
Automatic or manual temperature compensation
0/20 mA or 4/20 mA programmable isolated output
Dual set-point with hysteresis, delay and min/max programmable functions
Min/max and set-points timing alarm relay
Software: 3 access levels, user friendly, keyboard lock,watch-dog
EEPROM parameters storage
Automatic overload protection and reset
Extractable terminal blocks
96X96 (1/4" DIN) housing

Fieldbus Communication

The system is based on a digital communication through an open Modbus protocol, which interacts with the following Fieldbus: Profibus DP, Profinet, Modbus-TCP, DeviceNet, CANopen, EtherNet /IP/Modbus-TCP
Customers can view the main data and functions, such us:

- Primary and secondary measuring values
- Error messages
- Set-points relay, alarm relay and autoclean relay status

The "Virtual Instrument" is an innovative solution through which Customers can perform, from a remote station, all specific operations.
Custom versions with bidirectional communication of data are available for O.E.M. and system integrators.

Technical Specifications

common to all instruments of the 7685 Series

Temperature
Input: RTD Pt100 2/3 wires

Set point A and B:
Operation: ON/OFF
Hysteresis: adjustable
Delay: 0.0/99.9 s
* Function: Max/Min
Relay contacts: SPDT 220V 5 A (resistive load)

Alarm:
Low/High: adjustable
Delay: 0.0/99.9 s
* Relay status: activated/deactivated
* Alarm on max. operating time of set-point A/B: ON/OFF
* Max operating time of set-point A/B: 0/60 minutes
* Relay contacts: SPDT 220V 5 A (resistive load)

Analog output N° 1
* Input corresponding to the analog output (option 091.371x): selectable
* Output range: 0-20/4-20 mA (it can be made to represent any segment of the measuring scale
Response time: 2.5 s for 98%
Isolation: 250Vac
Load: 600 ohm max

Analog outpunt N° 2 (option 091.371x)
* Input corresponding to the analog output: selectable
* Output range: 0-20/4-20 mA (it can be made to represent any segment of the measuring scale
Response time: 2.5 s for 98%
Isolation: 250Vac
Load: 600 ohm max

Configuration (*)
The above parameters indicated by asterisks "*", may be selected in the Configuration menu

General Specification
Alphanumeric display: 1 line x 16 characters
Operating temperature: 0/50 °C
Humidity: 95% without condensation
Power supply: 110/220Vac ± 10% 50/60 Hz
Isolation: 4 kV between primary and secondary (IEC 348)
Power: 5VA max.
Terminal block: extractable
Weight: 850 g
Dimensions: 96 x 96 x 155 mm

Options

091.701	RS 232 isolated output The output sends the data to the serial port of the computer.
091.404	24Vac power supply
091.414X	9/36VDC power supply

The technical specifications could be changed without notice

Electrochemical sensors

Ion Selective Electrodes

B&C Electronics offers a wide range of Ion Selective Electrodes including:

1. Polymer Membrane Electrodes
2. Solid State Electrodes
3. Gas Sensing Electrodes
4. Glass Membrane Electrodes

Ion Selective Electrodes are available as half-cells (mono) or as glass or epoxy combination electrodes. Measurements with half-cell electrodes require the use of an additional reference electrode.

Ask our sales department in order to select the suitable ISE for continuous operation with our IC 7685 - IC 7685.010 Ion Concentration Controlles.

Electrode	P/N	Director Measurement Range		Slope mV/Decade at (25 °C)	pH Range	Temperature Range °C		Response time sec.	Imterferences (95%, in $1x10^{-2}$ M)
		Molar	PPM			continuous	not continuous		
Ammonia (NH3)	NH31501	1.0 - 5x10-7	17,000-0.01	56±3	> 11	0-50	-	30	Volatile amines
Ammonium (NH4+)	NH41501/NH41502	1.0 - 5x10-6	18,000-0.1	56± 2	4-10	0-50	-	30	K+
Bromide (Br -)	BRO1501/BRO1502	1.0 - 5X10-6	79,900-0.40	57±2	2-14	0-80	0-100	20	I-, CN-, S2-, elevate conc. di Cl-, NH3
Cadmium (Cd2+)	CD21501/CD21502	1x10-1 - 1x10-7	11,200-0.01	27±2	2-12	0-80	0-100	20	Ag+, Hg2+, Cu2+, elevate conc. di Pb2+, Fe2+
Calcium (Ca2+)	CAL1501/CAL1502	1.0 - 5x10-6	40,000-0.2	27±2	3-10	0-50	-	30	Pb2+, Hg2+,Cu2+, Ni2+
Carbon dioxide (CO2) (Carbonate CO32-)	CO21501	1x10-2 - 1x10-4	440-4.4	56±3	4.8-5.2	0-50	-	30	Volatile weak acids
Chloride (Cl-)	CLO1501/CLO1502	1.0 - 5x10-6	35,500-1.8	56±2	2-12	0-80	-	20	S2-, I-, CN-,Br -,
Copper (Cu2+)	CU01501/CU01502	1x10-1 - 1x10-8	6,350-6.4x10-4	27±2	0-12	0-80	0-100	20	Ag+, Hg2+, elevate conc. di Cl -, Br -, Fe2+
Cyanide (CN-)	CNO1501/CNO1502	1X10-2 - 5X10-6	260-0.13	57±2	11-13	0-80	0-100	20	S2-, I-, Br -, Cl-
Fluoride (F-)	FOO1501/FOO1502	Saturated - 1x10-6	Saturated -0;02	57±2	5-8	0-80	0-100	20	OH-
Fluoroborate (BF4-)	BF45101 BF41502	1.0 - 7x10-6	10,800-0,1 (as B)	57±2 56±2	2.5-11	0-50	-	30	Cl O4-, I, CN-
Iodide (I-)	IOO1501/IOO1502	1.0 - 5x10-8	127,000-6x10-3	57±2	0-14	0-80	0-100	20	S2-, CN-, NH3, S2O32-, Cl-,Br -
Lead (Pb2+)	PB21501/PB21502	1x10-1 - 1x10-6	20,700-0.2	25±2	3-8	0-80	0-100	20	Ag+, Hg2+, elevate conc. di Cd2+ e di Fe2+
Lithium (Li+)	LIT1501/LIT1502	1.0 - 1x10-5	6,900-0.7	56±2	5-10	0-50	-	30	Na+, K+,Ca2+
Nitrate (NO3-)	NO31501/NO31502	1.0 - 7x10-6	62,000-0.5	57±2	2.5-11	0-50	-	30	Cl O4-, I, CN-, BF4-
Nitrogen Oxide (NOx)	NOX1501	5x10-3 - 5x10-6	220-0.2	56±3	1.1-1.7	0-50	-	30	SO2 - HF, CH3 COOH
Perchlorate (Cl O4-)	PER1501/PER1502	1.0 - 7x10-6	98.000-0,7	56±2	2.5-11	0-50	-	30	No significant interference
Potassium (K+)	KOO1501/KOO1502	1.0 - 1x10-6	39,000-0.04	56±2	2-12	0-40	0-50	30	Cs+, NH4+
Silver/Sulfide (Ag+/S2-)	AGS1501 AGS1502	Ag+=1.0 - 1x10-7 S2-=1.0 - 1x10-7	107,900-0.01 32,100-0.003	57±2 27	2-12	0-80	0-100	20	Hg2+, Hg+
Sodium (Na+)	NA71501/NA71502	1.0 - 1x10-5	23,000-0.2	56±2	5-12	0-80	-	20	K+, Li+,H+,Ag+,Cs+
Surfactant (X+, X-)	SUR1501/SUR1502	5x10-2, 1x10-5	12,000-1.0	for titration	2-12	0-50	-	30	Similar types of Surfactants
Water Hardness (Ca2+/Mg2+)	WHA1501/WHA1502	1.0 - 1x10-5	4,000-0.4 (as Ca)	26±3	5-10	0-50	-	20	Cu2+, Zn2+, Ni2+, Fe2+

Models 1501 are mono, 1502 are combined glass body, 1503 are combined epoxy body. We can also provide sealed sensors with S8 connector.

On-line ISE Analyzers

Nitrate, Ammonium, Chloride and Fluoride

Thanks to the constant technological improvement applied ion selective sensors (ISE) manufacturing, it has been developed this series of process analyzers. These analyzers guarantee a great performance through time, with a limited cost.

The analyzer consists of two separate components:
- a chemistry module where the sample is conditioned.
- the measuring microprocessor based controller, IC 7685.010

The chemistry module is provided with a holder for the specific ISE and a couple of peristaltic pumps.
The system provides a continuous mixing of the sample with the ISA solutions necessary for the sensors, and an automatic calibration of the analyzer.

The controller IC 7685.010 allows to program the automatic calibration cycles. This eliminated most manual operations, along with providing a long and reliable monitoring within the required range.

Applications

Nitrate: drinking water and supply, municipality, sludge water treatment plants, de-nitrification plants, fertilizers, green houses.
Ammonium: sludge water treatment plants, de-nitrification plants, fertilizers, waste water.
Chloride: chemical waste water treatment plants, RO desalinization plants, paper industry, chemistry industry, waste water.
Fluoride: water supply plants, glass industry, chemistry industry.

Chemistry Module – Technical Characteristics

- Supplied with ISE sensor, combined, refillable, glass body.
- Interconnection cable, standard length 1.5 m.
- Supplied with small accessories and 6 months disposables
- Response time: 90% in 5 minutes
- Peristaltic pump sample, flow 5 cc/minute
- Peristaltic pump ISA reagent, flow 0.06 cc/minute
- Operating temperature: 0/50 °C
- Sample inlet: 1/4" I.D. hose barb
- Sample drain: 1/4" I.D. hose barb
- Recommended sample flowrate: 30/100 l/hour
- Power supply: 220Vac, 50/60 Hz.

IC7685.010

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