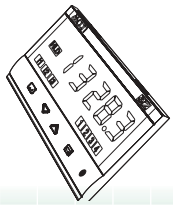
BT. 02.36 J5/E

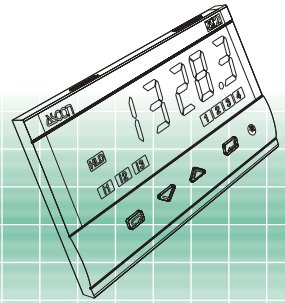
S E R I E S

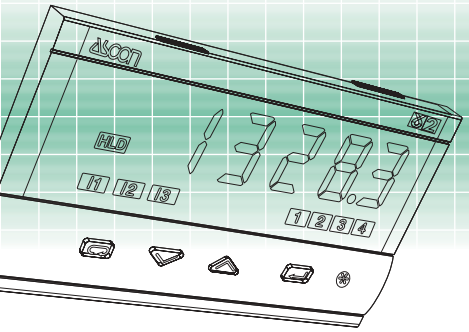
# Indicator - Transmitter
# Strain Gauge Input for
# Melt Pressure & Load Cell Transducers
# 1/8 DIN - 96x48 mm
# gammadue® series, J5 line

Accurate measurement of melt pressure and other process variables are provided by J5. The J5 is fully configurable from the keyboard or by means of a software configuration tool. The J5 display utilizes a large, bright 5 digit LED that can be configured to operate in green or red. The display can be configured to change color when in alarm condition.

- **Accuracy:** 0.1%
- **Measurement resolution:** 16 bit.
- **Overall response time:** 20 ms.
- **Display resolution:** configurable 1... 100 digit.
- **Main input:** 350Ω strain gauge, linear DC voltage and DC current. Square root extraction 16 segments linearizer for "custom" input.
- **Second input:** DC voltage and DC current. Suitable for temperature indication and signal conditioning (min., max., average, ratio, etc.) when combined with the Main input.
- **3 Digital inputs:** Independently configurable for alarms, display, and calibration handling…
- **Alarms:** 2 or 4 with ISA-A acknowledge.
- **Retransmission output:** optional, DC current
- **Communications:** optional, Modbus RS485.
- **Parameters protection:** 3 password levels.
- **Front protection:** IP65.








E

**ISO 9001** Certified

## J5 line
## The right solution for Melt pressure and Load cells applications

The 350Ω strain gauge bridge of the Melt pressure or load cell transducer can be energized by an internal stabilized 5 or 10Vdc. The reliability of the strain gauge is continuously monitored.

A simple front panel calibration routine is provided to automatically remove zero and span offsets. The automatic calibration routine can also be activated by using one of the three standard digital inputs, as well as being activated over serial communications. Tare function for load cells application is also provided.

Also available with the J5 indicator are: analogue retransmission, RS485 Modbus communications and additional configurable relay alarms with ISA type A alarm functions make the J5 indicator ideal to meet the most demanding monitoring requirements.

## Special functions

**Keyboard lock/unlock**: to prevent unauthorized operator actions

**Outputs lock/unlock**: to set the outputs to OFF

MIN / MAX **Max. or Min. of PV**: to display the maximum or the minimum stored value, using the ⩓ (max.) or ⩔ (min.) keys.

HOLD PEAK **Peak and Valley of PV**: to display the maximum and minimum read values in the following 2 modes

1) Positive/Negative Hold Peak Display, The displayed value is updated when higher/lower peak is detected.

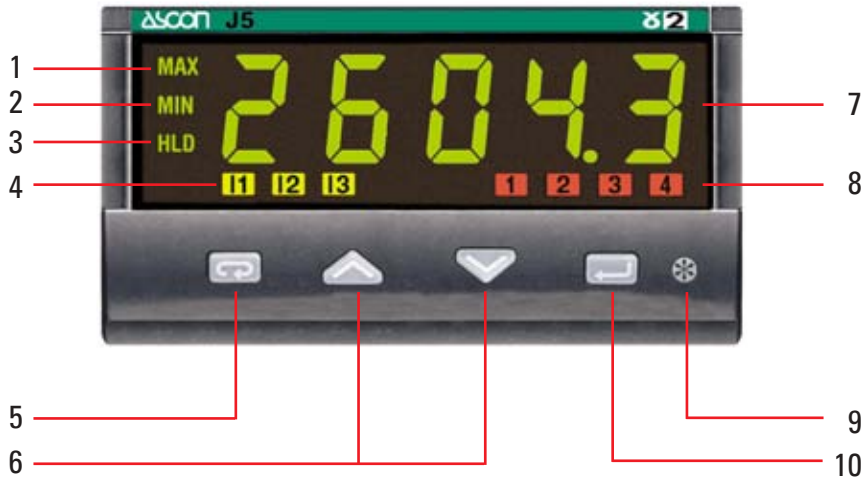
2) Positive/Negative Timed Peak Display, The Peak value is displayed for a programmable period of time.

HOLD PV **HOLD PV**: The inputs and all the other functions (alarms, retransmission, etc.) are frozen on the last value until the Hold PV is active.

CIN **Conditioned Input (CIN)**: CIN is the result of IN1 conditioned by IN2.

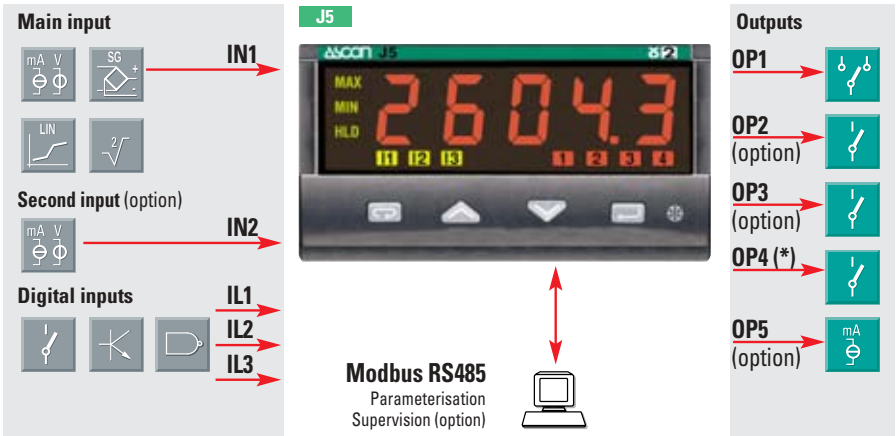
NO/NC **NO/NC Alarm status**: The relay contact status can be configured by default as either Normally Open (NO) or Normally Closed (NC).

## Display and key functions in operator mode




1 **MAX** Lit when the display shows the "Maximum value"
2 **MIN** Lit when the display shows the "Minimum value"
3 **HLD** Lit when the input is frozen by the HOLD command
4 **I1, I2, I3** Digital input status LEDs
5 Access to Parameters & Calibration menu, (password protected)
6 Displays the Minimum stored value
Displays the Maximum stored value
7 Dual colour, 5 digit display
8 **1, 2, 3, 4** Alarm output status LEDs
9 Alarm acknowledge, Reset Min./Max. stored values
10 Scanning of: Main input IN1, Second input IN2, Conditioned input value CIN, Min, and Max, values of IN1 or CIN, Engineering unit, Keyboard lock

## Resources




**Special functions**

MIN | MAX | HOLD PV | HOLD PEAK | CIN | NO/NC

**Digital inputs (IL1, IL2 or IL3) functions**

HOLD PV | HOLD PEAK | ACK ALM

*** Note:** OP4 output can be used for calibration shunt when strain gauge automatic calibration is required.

# Technical data

| Features at 25°C env. temp. | Description | | | |
|---|---|---|---|---|
| Dual colour display | 5 digit, high efficiency, height 15 mm, limits: -9999... 99999<br>red or green configurable depending on the user needs and/or the alarm status | | | |
| IN1 Main input (for signal ranges see "Ordering codes") | Common characteristics | A/D converter with 16 bit resolution<br>Overall response time: 20 ms<br>Input shift: ±1000 digit<br>Input filter: 1...30 s (OFF= 0) | | |
| | Accuracy | 0.1% ±1 digit; between 85...240 Vac the error is negligeable | | |
| | Strain gauge bridge excitation | 5V/10V selectable | From 350Ω... 10kΩ bridge load | |
| | DC input Current | 0/4... 20 mA | Engineering units, Floating decimal point, | Input drift: <0.1%/20°C ambient temperature |
| | DC input Voltage | 0...20 mV 0...1 V<br>0...50 mV 0...5 V<br>0...100 mV 0...10 V | Display resolution: 1, 2, 5, 10, 50, 100 digit selectable | |
| IN2 Second input (option) | DC Current | 0/4... 20 mA<br>R input = 60Ω | Accuracy 0.1%<br>Sampling rate 250 ms | |
| | DC Voltage | 1/0...5, 0...10 V | | |
| Digital inputs (3 logic not isolated from internal electronics) | The voltage free contact closure enables: | Keyboard lock,<br>Output block,<br>Alarm acknowledge,<br>Min./Max. reset,<br>Measure hold,<br>Peak or Valley hold,<br>Display variable select,<br>Strain gauge calibration,<br>Tare set | | |
| OP1 output | SPDT relay, 2A/250Vac (4A/120Vac) for resistive load | | | |
| OP2 output (opt.) | SPST relay N.O., 2A/250Vac (4A/120Vac) for resistive load | | | |
| OP3 output (opt.) | SPST relay N.O., 2A/250Vac (4A/120Vac) for resistive load | | | |
| OP4 output | SPST relay N.O., 2A/250Vac (4A/120Vac) for resistive load | | | |
| OP5 analogue output (option) | 0/4…20mA, 750Ω/15V max.<br>To retransmit: IN1, IN2 or CIN<br>Accuracy: 0.1%<br>Resolution: 12 bit<br>Galvanic isolation: 500Vac/1min | | | |
| AL1 - AL2 - AL3 - AL4 | Hysteresis | 0.1…10.0% | | |
| | Action: Active high / Active low | Action type | Changing rate threshold | 0.1...5.0 digit/s |
| | | | Deviation threshold | ± range |
| | | | Band threshold | 0…range |
| | | | Absolute threshold | whole range |
| | Action: Special functions | Strain gauge break,<br>Acknowledge (latching),<br>Activation inhibit (blocking),<br>OR'ed of different sources of alarms,<br>ISA-A acknowledge sequence for activation of visual and audible alarm | | |
| Serial comms. (optional) | RS485 isolated, Modbus/Jbus protocol,<br>1200, 2400, 4800, 9600, 19200, 36400, 56800 bit/s, 3 wire | | | |
| Auxiliary power supply | +24Vdc ±20%, 30 mA max. for a 4... 20 mA, 2 wire transmitter | | | |
| Operational safety | Input measure | Detection of out of range, short circuit or sensor break with automatic activation of the safety strategy and alerts on display | | |
| | Parameters | A non volatile memory stores for unlimited time all the configuration and parameter values | | |
| | Access protection | 3 password levels to access the strain gauge calibration, Configuration and Parameters data, Keyboard lock, Outputs Block | | |
| General characteristics | Power supply | 100...240Vac (-15...+10%) 50/60Hz or 24Vac (-25...+15%) 50/60Hz and 24Vdc (-15...+25%) | Power consumption 4W max. (PTC protected) | |
| | Safety | Compliance EN61010-1 (IEC 1010-1), installation class 2 (2.5kV) pollution class 2, class II instrument | | |
| | Electromagnetic compatibility | Compliance to the CE standards for industrial systems and equipment | | |
| | UL & cUL approval | File E176452 (pending) | | |
| | Protection EN60529 (IEC529) | IP65 front panel | | |
| | Dimensions | 1/8 DIN - 96 x 48, depth 110 mm, weight 250g approx. | | |

## Measure conditioning

Primary input IN1 can be Conditioned by the secondary input IN2; the conditioned input (C in) can be:

| Id | Description |
|---|---|
| in 1 | Cin = IN1 |
| in2 | Cin = IN2 |
| SuM | Cin = IN1 + IN2 |
| Sub | Cin = IN1 - IN2 |
| Avg | Cin = (IN1 + IN2)/2 |
| H iG | Cin = MAX (IN1, IN2) |
| LoU | Cin = Min (IN1, IN2) |
| MuL | Cin = IN1 * IN2 |
| rt io | Cin = IN1/IN2 |

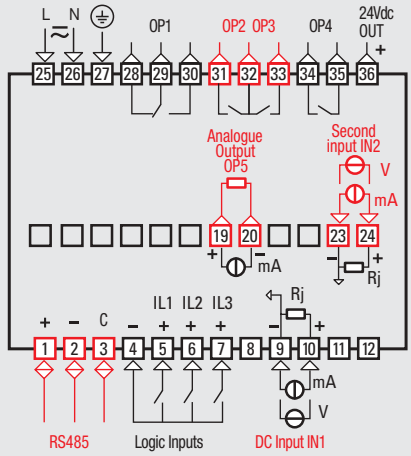
## Default display variable

Variables that must be displayed as default include:

| Id | Description |
|---|---|
| In 1 | Input 1 |
| In2 | Input 2 |
| C in | Conditioned input |
| Lo | Minimum stored value |
| H i | Maximum stored value |
| Un it | Selected engineering unit |

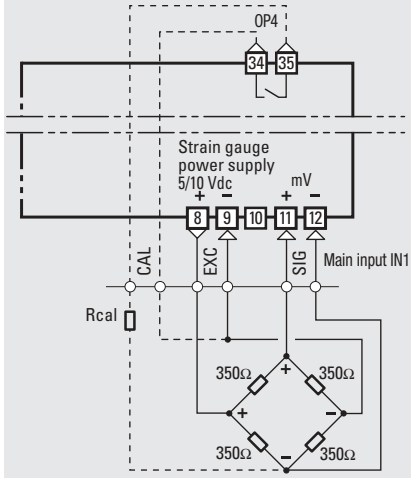
## Electrical wiring

DC input IN1




**Note:** The terminals in red are optional

Strain gauge input IN1



# Ordering Codes

Line | Basic model | Accessories | Configuration (1)

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 1st part | | | | | 2nd part | | | | |
| Mod.: | J5 | A | B | C | D | – | 0 | F | 0 | 0 | / | I | L | M | N | – | O | P | Q | R |

Power supply
Outputs
Serial comm.s
Options
Instructions handbook
Alarm AL4
Alarm AL3
Alarm AL2
Alarm AL1
Peak Hold
Display Mode
IN1 Input Type

| Power supply | A |
|---|---|
| 100...240Vac (-15...+10%) | 3 |
| 24Vac (-25...+12%) or 24Vdc (-15...+25%) | 5 |

| OP1 | OP2 | OP3 | OP4 (2) outputs | B |
|---|---|---|---|---|
| Relay | - | - | Relay | 7 |
| Relay | Relay | Relay | Relay | 9 |

| Serial communications | C |
|---|---|
| Not fitted | 0 |
| RS 485 Modbus/Jbus SLAVE | 5 |

| Options | D |
|---|---|
| None | 0 |
| Analogue output for signal retransmission | 1 |
| Second input IN2 | 2 |
| Analogue output for signal retransmission + Second input IN2 | 5 |

| Instruction handbook | F |
|---|---|
| English (standard) | 8 |

**Notes:**

**1** If the configuration code is not specified, the J5 is supplied with the default configuration: J5 _ _ _ _ - _ _ _ _ / 0000 - 0000.

**2** OP4 output can be used for high end scale calibration of the strain gauge.

**3** Configuration examples:
- For strain gauge transducer rated 350Ω, 3.3 mV/V, 10 V excitation Voltage, select: **I: 1, L: 2;**
- For standard transmitter 4... 20 mA, select: **I: 8, L: 0.**

| IN1 Input range | IN1 Input Type | I | L |
|---|---|---|---|
| DC input 0... 20mV | Linear | 0 | 0 |
| DC input 0... 50mV | | 1 | 0 |
| DC input 0... 100mV | | 2 | 0 |
| DC input 0... 1 V | | 3 | 0 |
| DC input 0... 5 V | | 4 | 0 |
| DC input 1... 5 V | | 5 | 0 |
| DC input 0... 10 V | | 6 | 0 |
| DC input 0... 20 mA | | 7 | 0 |
| DC input 4... 20 mA | | 8 | 0 |
| DC input 0... 20mV | Strain gauge 5V bridge excitation | 0 | 1 |
| DC input 0... 50mV | | 1 | 1 |
| DC input 0... 100mV | | 2 | 1 |
| DC input 0... 20mV | Strain gauge 10V bridge excitation | 0 | 2 |
| DC input 0... 50mV | | 1 | 2 |
| DC input 0... 100mV | | 2 | 2 |

| Display mode | M |
|---|---|
| Green | 0 |
| Red | 1 |
| Red when alarm 1 (AL1) active | 2 |
| Red when at least one alarm is active (OR function) | 3 |
| Alternate between IN1, IN2 and CIN value | 4 |
| Manual forced display of IN1, IN2, CIN, Lo or Hi value | 5 |

| Hold of the peak values | N |
|---|---|
| Disabled | 0 |
| Shows the Max. value (HI peak) for a programmable period of time | 1 |
| Shows the Min. value (LO peak) for a programmable period of time | 2 |

| AL1 - AL2 - AL3 - AL4 alarm type and function | | O P Q R<br>AL 1 2 3 4 |
|---|---|---|
| Disabled | | 0 |
| Sensor break alarm | | 1 |
| Absolute | active high | 2 |
| | active low | 3 |
| Deviation | active high | 4 |
| | active low | 5 |
| Band | active out | 6 |
| | active in | 7 |
| Rate alarm (AL1 only) | | 8 - |


**ASCON spa**
**Via Falzarego, 9/11**
**20021 Baranzate**
**(Milano) Italy**
**Tel. +39 02 333 371**
**Fax +39 02 350 4243**
**http://www.ascon.it**
**sales@ascon.it**

**ASCON FRANCE**
**2 bis, Rue Paul Henri Spaak**
**ST. THIBAULT DES VIGNES**
**F-77462 LAGNY SUR MARNE - Cedex**
**Tél. +33 (0) 1 64 30 62 62**
**Fax +33 (0) 1 64 30 84 98**
**www.ascon.fr**
**ascon.france@ascon.fr**

**AGENCE EST**
**Tél. +33 (3) 89 76 99 89**
**Fax +33 (3) 89 76 87 03**

**AGENCE SUD-EST**
**Tél. +33 (0) 4 74 27 82 81**
**Fax +33 (0) 4 74 27 81 71**

**ASCON CORPORATION**
**1884 East Fabyan Parkway**
**Batavia, Illinois 60510**
**Tel. +1 630 482 2950**
**Fax +1 630 482 295**
**www.asconcorp.com**
**info@asconcorp.com**

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