

Notes

1 To earth screened cables, connect the screen at supply end.

2 To earth screened cables, connect the screen at terminal block.

Notes

1 Thermocouple

2 - 3-wire Platinum

3 Do NOT run power and signal cables together.

4 Use copper conductors only.

5 electrical damage.

6 Connect the Power Supply last to avoid

Notes

1 These terminals can be configured as a control output, an alarm, or event output. A single changeover relay is provided as standard.

2 Relay Rating

3 Max - 264Vac, 2A

4 Min - 1V, 1mA

5 Normally Closed

6 Common

7 Normally Open

8 AC

9 AB

10 AA

11 BA

12 BB

13 BC

14 BH

15 BI

16 BJ

17 BK

18 BL

19 BM

20 BN

21 BO

22 BP

23 BQ

24 BR

25 BS

26 BT

27 BU

28 BV

29 BW

30 BX

31 BY

32 BZ

33 CA

34 CB

35 CC

36 CD

37 CE

38 CF

39 CG

40 CH

41 CI

42 CJ

43 CK

44 CL

45 CM

46 CN

47 CO

48 CP

49 CQ

50 CR

51 CS

52 CT

53 CU

54 CV

55 CW

56 CX

57 CY

58 CZ

59 DA

60 DB

61 DC

62 DD

63 DE

64 DF

65 DG

66 DH

67 DI

68 DJ

69 DK

70 DL

71 DM

72 DN

73 DO

74 DP

75 DQ

76 DR

77 DS

78 DT

79 DU

80 DV

81 DW

82 DX

83 DY

84 DZ

85 EA

86 EB

87 EC

88 ED

89 EE

90 EF

91 EG

92 EH

93 EI

94 EJ

95 EK

96 EL

97 EM

98 EN

99 EO

100 EP

101 EQ

102 ER

103 ES

104 ET

105 EU

106 EV

107 EW

108 EX

109 EY

110 EZ

111 FA

112 FB

113 FC

114 FD

115 FE

116 FF

117 FG

118 FH

119 FI

120 FJ

121 FK

122 FL

123 FM

124 FN

125 FO

126 FP

127 FQ

128 FR

129 FS

130 FT

131 FU

132 FV

133 FW

134 FX

135 FY

136 FZ

137 GA

138 GB

139 GC

140 GD

141 GE

142 GF

143 GG

144 GH

145 GI

146 GJ

147 GK

148 GL

149 GM

150 GN

151 GO

152 GP

153 GQ

154 GR

155 GS

156 GT

157 GU

158 GV

159 GW

160 GX

161 GY

162 GZ

163 HA

164 HB

165 HC

166 HD

167 HE

168 HF

169 HG

170 HH

171 HI

172 HJ

173 HK

174 HL

175 HM

176 HN

177 HO

178 HP

179 HQ

180 HR

181 HS

182 HT

183 HU

184 HV

185 HW

186 HX

187 HY

188 HZ

189 IA

190 IB

191 IC

192 ID

193 IE

194 IF

195 IG

196 IH

197 II

198 IJ

199 IK

200 IL

201 IM

202 IN

203 IO

204 IP

205 IQ

206 IR

207 IS

208 IT

209 IU

210 IV

211 IW

212 IX

213 IY

214 IZ

215 JA

216 JB

217 JC

218 JD

219 JE

220 JF

221 JG

222 JH

223 JI

224 JJ

225 JK

226 JL

227 JM

228 JN

229 JO

230 JP

231 JQ

232 JR

233 JS

234 JT

235 JU

236 JV

237 JW

238 JX

239 JY

240 JZ

241 KA

242 KB

243 KC

244 KD

245 KE

246 KF

247 KG

248 KH

249 KI

250 KJ

251 KK

252 KL

253 KM

254 KN

255 KO

256 KP

257 KQ

258 KR

259 KS

260 KT

261 KU

262 KV

263 KW

264 KX

265 KY

266 KZ

267 LA

268 LB

269 LC

270 LD

271 LE

272 LF

273 LG

274 LH

275 LI

276 LJ

277 LK

278 LL

279 LM

280 LN

281 LO

282 LP

283 LQ

284 LR

285 LS

286 LT

287 LU

288 LV

289 LW

290 LX

291 LY

292 LZ

293 MA

294 MB

295 MC

296 MD

297 ME

298 MF

299 MG

300 MH

301 MI

302 MJ

303 MK

304 ML

305 MM

306 MN

307 MO

308 MP

309 MQ

310 MR

311 MS

312 MT

313 MU

314 MV

315 MW

316 MX

317 MY

318 MZ

319 NA

320 NB

321 NC

322 ND

323 NE

324 NF

325 NG

326 NH

327 NI

328 NJ

329 NK

330 NL

331 NM

332 NN

333 NO

334 NP

335 NQ

336 NR

337 NS

338 NT

339 NU

340 NV

341 NW

342 NX

343 NY

344 NZ

345 OA

346 OB

347 OC

348 OD

349 OE

350 OF

351 OG

352 OH

353 OI

354 OJ

355 OK

356 OL

357 OM

358 ON

359 OO

360 OP

361 OQ

362 OR

363 OS

364 OT

365 OU

366 OV

367 OW

368 OX

369 OY

370 OZ

371 PA

372 PB

373 PC

374 PD

375 PE

376 PF

377 PG

378 PH

379 PI

380 PJ

381 PK

382 PL

383 PM

384 PN

385 PO

386 PP

387 PQ

388 PR

389 PS

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392 PV

393 PW

394 PX

395 PY

396 PZ

397 QA

398 QB

399 QC

400 QD

401 QE

402 QF

403 QG

404 QH

405 QI

406 QJ

407 QK

408 QL

409 QM

410 QN

411 QO

412 QP

413 QQ

414 QR

415 QS

416 QT

417 QU

418 QV

419 QW

420 QX

421 QY

422 QZ

423 RA

424 RB

425 RC

426 RD

427 RE

428 RF

429 RG

430 RH

431 RI

432 RJ

433 RK

434 RL

435 RM

436 RN

437 RO

438 RP

439 RQ

440 RR

441 RS

442 RT

443 RU

444 RV

445 RW

446 RX

447 RY

448 RZ

449 SA

450 SB

451 SC

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466 SR

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469 SU

470 SV

471 SW

472 SX

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474 SZ

475 TA

476 TB

477 TC

478 TD

479 TE

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501 UA

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553 WF

554 WG

555 WH

556 WI

557 WJ

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561 WN

562 WO

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564 WQ

565 WR

566 WS

567 WT

568 WY

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573 XD

574 XE

575 XF

576 XG

577 XH

578 XI

579 XJ

580 XK

581 XL

582 XM

583 XN

584 XO

585 XP

586 XQ

587 XR

588 XS

589 XT

590 XU

591 XV

592 XW

593 XX

594 XY

595 XZ

596 YA

597 YB

598 YC

599 YD

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601 YF

602 YG

603 YH

604 YI

605 YJ

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614 YS

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617 YV

618 YW

619 YX

620 YZ

621 ZA

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625 ZE

626 ZF

627 ZG

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26 BT

27 BU

28 BV

29 BW

30 BX

31 BY

32 BZ

33 CA

34 CB

35 CC

36 CD

37 CE

38 CF

39 CG

40 CH

41 CI

42 CJ

43 CK

44 CL

45 CM

46 CN

47 CO

48 CP

49 CQ

50 CR

51 CS

52 CT

53 CU

54 CV

55 CW

56 CX

57 CY

58 CZ

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61 DC

62 DD

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67 DI

68 DJ

69 DK

70 DL

71 DM

72 DN

73 DO

74 DP

75 DQ

76 DR

77 DS

78 DT

79 DU

80 DV

81 DW

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83 DY

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97 EM

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106 EV

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108 EX

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158 GV

159 GW

160 GX

161 GY

162 GZ

163 HA

164 HB

165 HC

166 HD

167 HE

168 HF

169 HG

170 HH

171 HI

172 HJ

173 HK

174 HL

175 HM

176 HN

177 HO

178 HP

179 HQ

180 HR

181 HS

182 HT

183 HU

184 HV

185 HW

186 HX

187 HY

188 HZ

189 IA

190 IB

191 IC

192 ID

193 IE

194 IF

195 IG

196 IH

197 II

198 IJ

199 IK

200 IL

201 IM

202 IN

203 IO

204 IP

205 IQ

206 IR

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208 IT

209 IU

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232 JR

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271 LE

272 LF

273 LG

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275 LI

276 LJ

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287 LU

288 LV

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290 LX

291 LY

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298 MF

299 MG

300 MH

301 MI

302 MJ

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309 MQ

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311 MS

312 MT

313 MU

314 MV

315 MW

316 MX

317 MY

318 MZ

319 NA

320 NB

321 NC

322 ND

323 NE

324 NF

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326 NH

327 NI

328 NJ

329 NK

330 NL

331 NM

332 NN

333 NO

334 NP

335 NQ

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421 QY

422 QZ

423 RA

424 RB

425 RC

426 RD

427 RE

428 RF

429 RG

430 RH

431 RI

432 RJ

433 RK

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456 SH

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465 SQ

466 SR

467 SS

468 ST

469 SU

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471 SW

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581 XL

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583 XN

584 XO

585 XP

586 XQ

587 XR

588 XS

589 XT

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591 XV

592 XW

593 XX

594 XY

595 XZ

596 YA

597 YB

598 YC

599 YD

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610 YO

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612 YQ

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615 YT

616 YU

617 YV

618 YW

619 YX

620 YZ

621 ZA

622 ZB

623 ZC

624 ZD

625 ZE

626 ZF

627 ZG

628 ZH

629 ZI

630 ZJ

631 ZK

632 ZL

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18 BL

19 BM

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2



The Unit

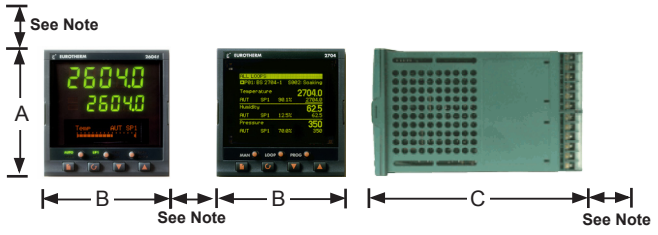
Before installing the unit check the packaging contains the Unit, mounting components, and a CD, and the Hardware code and Configuration code to ensure that it is suitable for the process specified.

TO MOUNT THE UNIT

The Unit is supplied as two parts, the controller and the sleeve, but is intended to be mounted together through a cut out in the front panel of an electrical control cabinet. It is held in position using the panel retaining clips supplied.

The Unit can be mounted vertically or on a sloping panel of maximum thickness 15mm (0.6 inches). Adequate access space must be available at the rear of the instrument panel for wiring and servicing purposes.

Note. Once mounted, the Controller may be removed from the sleeve at any time.



DIRECT PANEL MOUNTING

- 1. Check that the mounting panel is not thicker than 15mm (0.6 inches) (typically for wood or plastic) and not thinner than 2mm (0.08”) (for steel).
- 2. In the mounting panel, cut an aperture 92mm x 92mm (+.8mm).

Note. Ensure the Unit is not mounted close to any device that is likely to produce enough heat to affect the performance.

- 3. Insert the Unit through the panel cut out.
- 4. Spring the upper and lower panel retaining clips into place. Secure the unit by holding it level and pushing both retaining clips forward.

Once fitted this unit is IP65 rated.

Note. If removing the retaining clips, unhook the side using fingers or a screwdriver, and extract (slide) the unit from the mounting panel.

REMOVING THE CONTROLLER

The controller can be removed from the sleeve by easing the latching ears on either side of the sleeve outwards and pulling the controller forward. When fitting the controller back into the sleeve, ensure the latching ears click into place.

Warning

For safety reasons and to prevent premature wear on the connectors the Power to the Unit MUST be isolated before removing the Controller.

Environmental Requirements	Minimum	Maximum
Temperature	0°C	50°C
Humidity (Relative - RH)	5% RH	95% RH
Altitude		2000m

Communications - DeviceNet®

Protocol is DeviceNet interface requiring each node to have a unique address on the DeviceNet network and must be set to the same Baud rate.

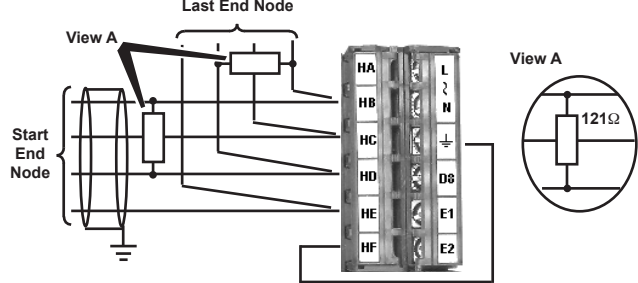
Note. Refer to DeviceNet™ Communications Handbook, Part No. HA027506ENG.

Legend	CAN Label	Chip Colour	Description
HA	V+	Red	DeviceNet® network power positive terminal.
Note. If the DeviceNet network does not supply the power, connect to the positive terminal of an external 11-25 Vdc power supply.			
HB	CAN_H	White	DeviceNet™ CAN_H data bus terminal.
HC	DRAIN	None	Shield/Drain wire connection. To prevent ground loops, the DeviceNet™ network should be grounded in only one location.
HD	CAN_L	Blue	DeviceNet™ CAN_L data bus terminal.
HE	V-	Black	DeviceNet™ network power negative terminal.
Note. If the DeviceNet network does not supply the power, connect to the negative terminal of an external 11-25 Vdc power supply.			
HF	-		Connect to instrument earth.

Caution

Power Taps are recommended if connecting a DC power supply to the DeviceNet trunk line. To connect multiple Power supplies, fit a Schottky diode to the V+ of each Power Supply unit. Connect 2 fuses or Circuit Breakers to protect the Bus from excessive current, that may cause damage to the cables and connectors. Connect the Instrument Earth terminal, HF, to the main Power supply earth terminal.

WIRING



TERMINATION RESISTOR

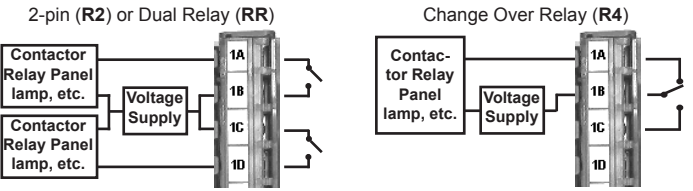
A 121Ω Termination Resistor must not be fitted as any part of a master or slave if already internally installed.

Plug-in I/O Modules

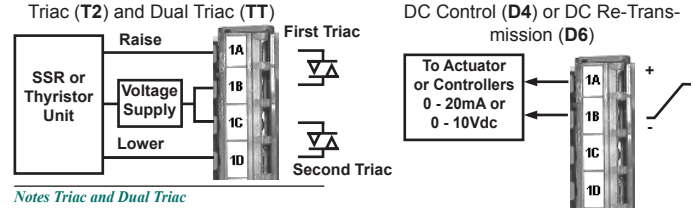
Use 4-terminal I/O modules at Module 1, 3, 4, 5, and 6 only, except where stated.

Note. Check the order code on the side of the unit, to learn what modules are fitted, and use 'View Config' level to inspect each Module position. Any changes to the Modules Position should be recorded on the side of the unit.

OUTPUT TYPES



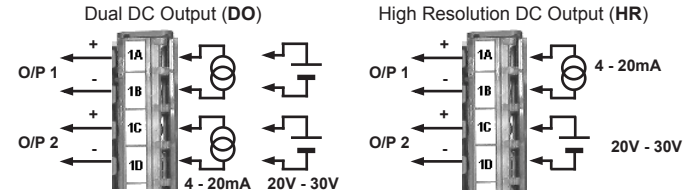
Note. Both Relays support 264Vac, 2A max, 12V, 10mA min.



Notes Triac and Dual Triac

- 1 The combined current rating for the Dual Triacs must not exceed 0.7A, 30 - 264Vac.
- 2 Dual Relay modules can be configured to offer the same control as the Dual Triac.

Note. Wire to Actuators for DC Control, and to Controllers for DC Re-Transmission.

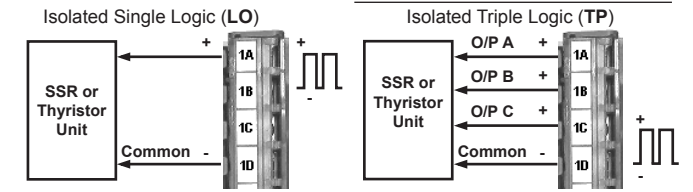


Notes Dual DC Output

- 1 Supports 4 - 20mA or 24Vdc power supply.
- 2 Fit in Module positions, 1, 4, and 5 only.

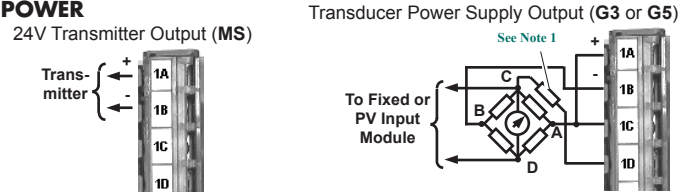
Notes High Resolution Dual DC Output

- 1 Supports one 15-bit 4 - 20mA and one 24Vdc power supply per channel.
- 2 Fit in Module positions, 1, 4, and 5 only.



Note. Isolated Single Logic Output supports 18Vdc, @ 24mA max, per channel.

Note. Isolated Triple Logic Output supports 18Vdc, @ 8mA max, per channel.

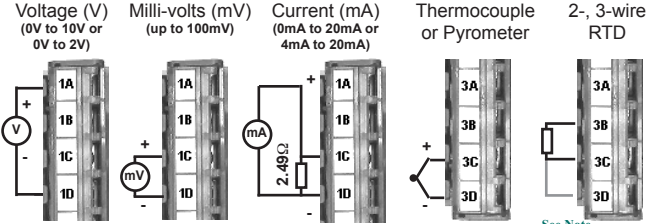


Note. 20mA to external transmitter.

- Notes
- 1 Fit an external calibration resistor if not already installed.
- 2 Use screened cable to reduce interference for Strain Gauge power supply connections
- 3 Uses 5 or 10Vdc to power Strain Gauge Transducer
- 4 Uses Shunt Contact for automatic calibration.

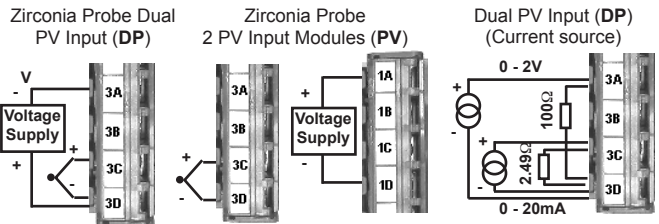
INPUT TYPES

These support both PV (PV), Module positions 3 and 6 only, and Analogue Input (AM) Modules, any position except Module position 5.



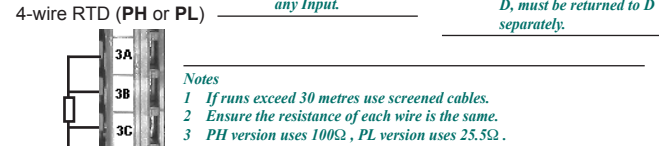
Note. If using 2-wire PRT, fit link between C and D.

These support PV Input (PV) Modules, restricted to Module positions 3 and 6.



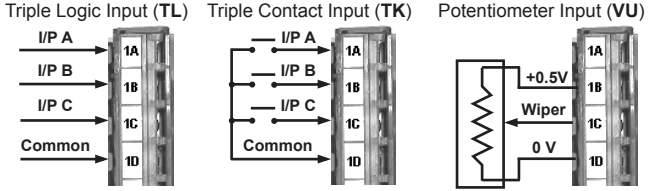
Note. Wire Voltage Supply to any Input.

Note. Common connections to D, must be returned to D separately.



- Notes
- 1 If runs exceed 30 metres use screened cables.
- 2 Ensure the resistance of each wire is the same.
- 3 PH version uses 100Ω, PL version uses 25.5Ω.

These support Digital and Potentiometer Input Modules fitted in any position.

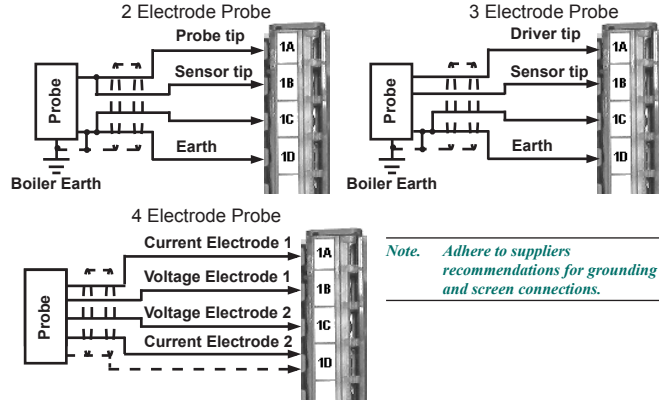


Note. <5V Off, >10.8V On. Limits: -3V, +30V.

Note. <100Ω On, >28KΩ V Off.

Note. 100Ω to 15KΩ range.

TDS MODULE (2704 ONLY)



Note. Adhere to suppliers recommendations for grounding and screen connections.

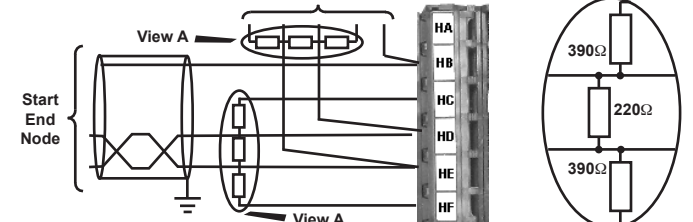
Communications - Profibus

Protocol is Profibus DP requiring each node to have a unique address on the Profibus network and must be set to the same Baud rate.

Note. Refer to Profibus Communications Handbook, Part No. HA026290.

Legend	Signal	9 Pin D Type	Description
HA			N/A
HB	Shield	1	Shield/Drain wire connection.
HC	VP (+5V)	6	5V supply
HD	Rx/Tx (+ve)	3	Profibus network power positive terminal.
HE	Rx/Tx (-ve)	8	Profibus network power negative terminal.
HF	Dig Grnd	5	Digital Ground.

WIRING



Use standard ProfiBus cables, 'Line A' and 'Line B', with special 9 pin D Type male connector headers, allowing one or two cables to be fitted. A termination load is built in with an ON/OFF switch, set to ON at the two ends of the line. When using 9 pin D Type connections a further assembly is required.

TERMINATION RESISTOR

The Profibus specification states that the Termination Resistor must be fitted to the last nodes in the line.

Communications - Modbus/TCP

Protocol is Modbus/TCP, 10 Base T on an Ethernet network.

Note. Supported by the 2704 Unit only.

This requires an additional connector, Part no. SUB27/EA. It connects to the HA to HF terminals and allows communications via standard CAT5 cables directly to a Computer or Ethernet Switching unit/Hub.

Note. A cross-over cable MUST be used if connecting directly to a Computer operating as a Network master.

RJ45 Pin	Colour	Signal
8	Brown	N/A
7	Brown/White	N/A
6	Green	Rx-
5	Blue/White	N/A
4	Blue	N/A
3	Green/White	Rx+
2	Orange	Tx-
1	Orange/White	Tx+

Plug shroud to Cable screen



Communications - Modbus

Protocol is Modbus RTU, EIA232, EIA485 3-wire or 5-wire.

Note. Refer to 2000 Series Communications Manual, Part No. HA026230.

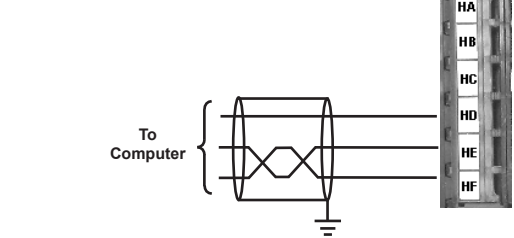
The Modbus network connection is via the HA to HF and JA to JF terminal connections. Units MUST be connected in a daisy-chain method using twisted pair cable.

Note. The Screen from each cable should be connected through and grounded at one point only.

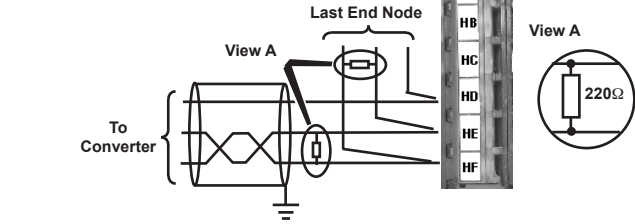
Legend	EIA232	EIA485 3-wire	EIA485 5-wire
HA (JA)	N/A	N/A	N/A
HB (JB)	N/A	N/A	Rx+
HC (JC)	N/A	N/A	Rx-
HD (JD)	Com	Com	Com
HE (JE)	Rx	A	Tx+
HF (JF)	Tx	B	Tx-

Note. Alternatively, use the JA to JF terminals.

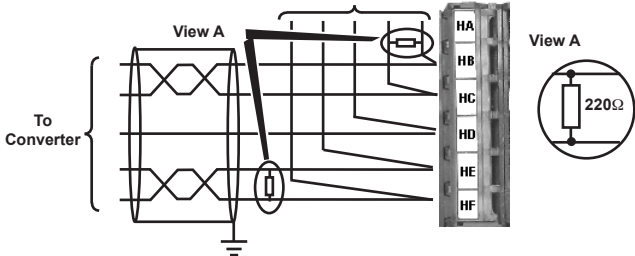
EIA232



EIA485 3-WIRE



EIA485 5-WIRE



Notes EIA485

- 1 Use twisted pair cable throughout.
- 2 An EIA232 to EIA485 converter is required when connecting directly to a Computer.

TERMINATION RESISTOR

A 220Ω Termination Resistor MUST be fitted across the Receiver signals (Rx+ and Rx-) at each end of a maximum 32 communicating instruments.