



Inelco Hunter Limited



EMM

MIL-DTL-83513- G
& MIL-DTL-55302-G

PERFORMANCES

MINIATURIZED AND RUGGED

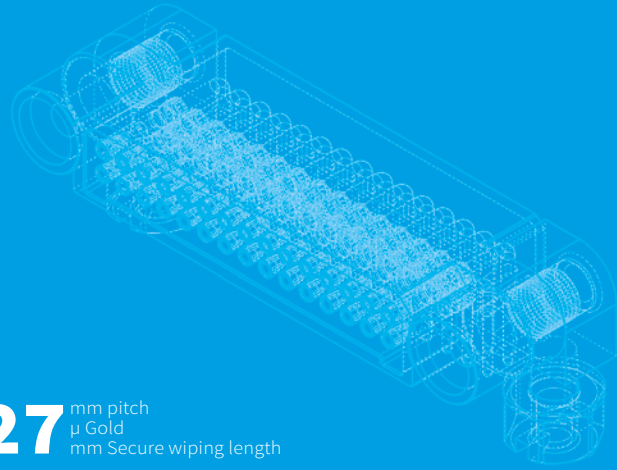
FOR HARSH ENVIRONMENT



INTRO

EMM ACHIEVES
EXTRA SPACE
AND WEIGHT
REDUCTION
TO MEET YOUR
MINIATURIZATION
NEEDS IN THE
MOST EXTREME
ENVIRONMENTS

Designed to meet the performance requirements of **MIL 83513-G**, the range combines rugged design with enhanced electrical and environmental performances



1.27 mm pitch
 μ Gold
mm Secure wiping length

FROM THE IDEA TO THE FINISHED PRODUCT

SPACE SAVING

Easy installation thanks to a perfect balance between the pitch and the overall dimensions of the range.

REVERSED CONTACTS

Male contacts, thinner by essence, are protected inside the insulator.

HIGH MODULARITY

Straight male and female thru-hole and SMT
90° male and female thru-hole and male SMT
Cable AWG 24-30
04 to 60 pins.

90° BACK PROTECTION

Featured exclusively on 90° connectors mount, contacts are protected at the back by an ingenious shape, also guaranteeing a perfect alignment of the contacts.

→ **DESIGNED IN 2018**

INTERCHANGEABLE HARDWARE

Locking and guiding functions available, adaptable on both male and female connectors

MATERIALS

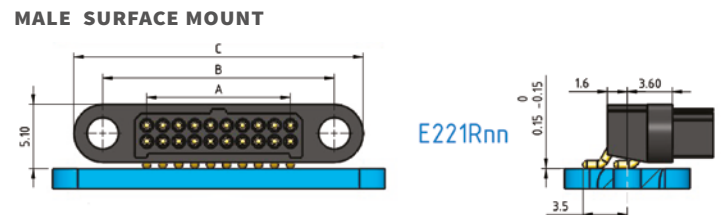
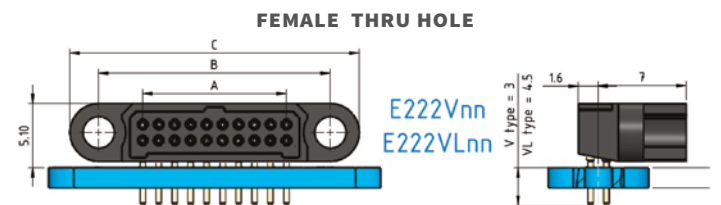
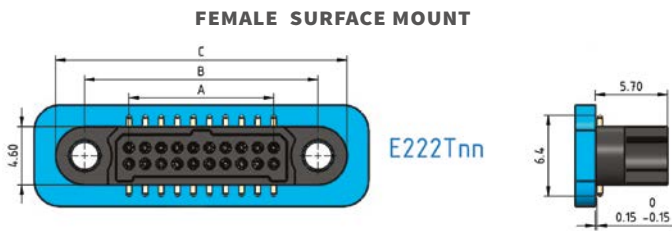
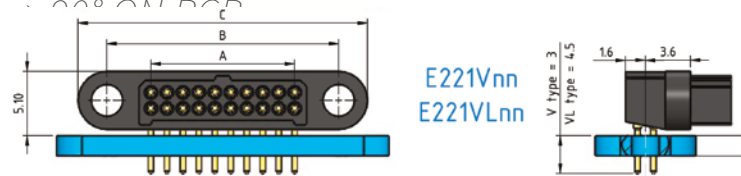
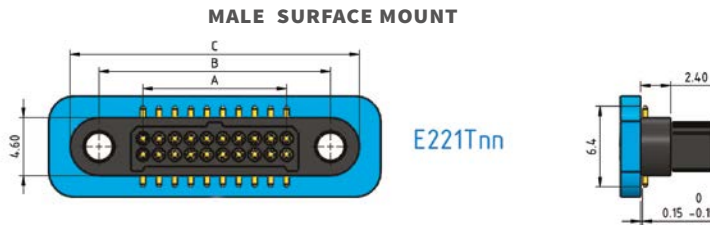
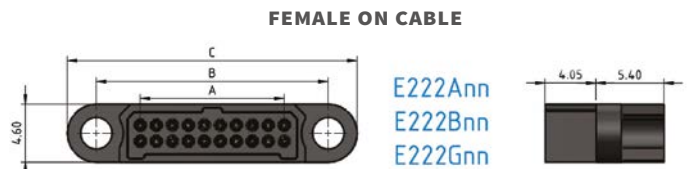
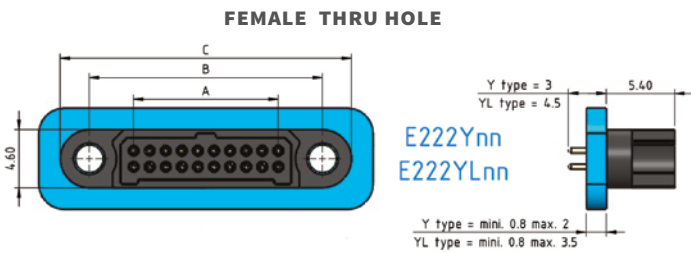
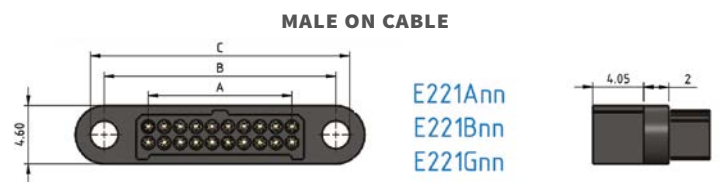
Moulding: High performance glass fiber composite (LCP)
Male pins: Copper alloy, Au 0.75 μ
Female pins with tulip technology (clip with 4 finger spring contact)
Outer: Copper alloy, Au 0.125 μ
• Inner: Beryllium copper, Au 1.27 μ
Fixing hardware: passivated stainless steel 300 series

EMM / Overall dimensions

Housings

→ STRAIGHT ON PCB

→ CABLE



Dimension table																													
LF contact number	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
A=Distance between pins (mm)	1.27	2.54	3.81	5.08	6.35	7.62	8.89	10.16	11.43	12.70	13.97	15.24	16.51	17.78	19.05	20.32	21.59	22.86	24.13	25.40	26.67	27.94	29.21	30.48	31.75	33.02	34.29	35.56	36.83
B=Distance between fixings (mm)	8.27	9.54	10.81	12.08	13.35	14.62	15.89	17.16	18.43	19.70	20.97	22.24	23.51	24.78	26.05	27.32	28.59	29.86	31.13	32.4	33.67	34.94	36.21	37.48	38.75	40.02	41.29	42.56	43.83
C=Distance between extremities (mm)	12.87	14.14	15.41	16.68	17.95	19.22	20.49	21.76	23.03	24.3	25.57	26.84	28.11	29.38	30.65	31.92	33.19	34.46	35.73	37	38.27	39.54	40.81	42.02	43.35	44.62	45.89	47.16	48.43

Fixing hardware

→ STRAIGHT ON PCB

Packaged in bags
Torque 0.3 Nm

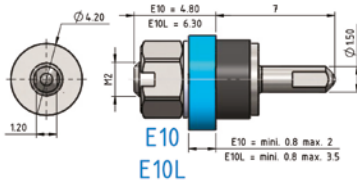
→ 90° ON PCB

Packaged in bags
Torque 0.3 Nm

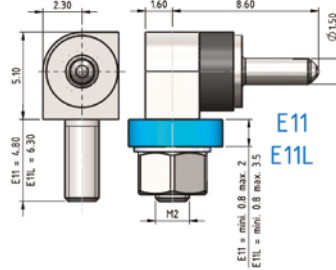
→ HARNESS

Mounted on the connector
Torque 0.2 Nm

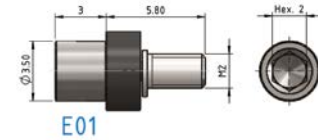
MALE STRAIGHT GUIDING E10/E10L



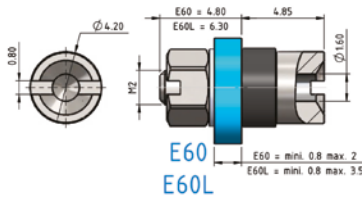
MALE 90° GUIDING E11/E11L



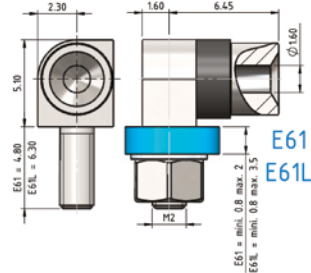
JACKSCREW E01



FEMALE STRAIGHT GUIDING E60/E60L



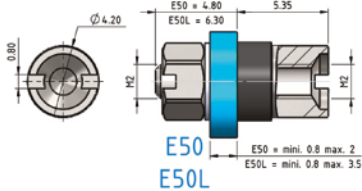
FEMALE 90° GUIDING E61/E61L



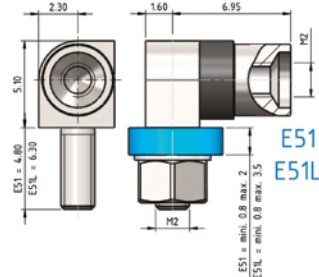
CAPTIVE SCREW E02



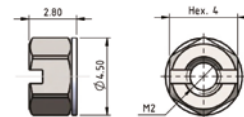
FEMALE STRAIGHT JACKSCREW E50/E50L



FEMALE 90° JACKSCREW E51/E51L



→ NUT



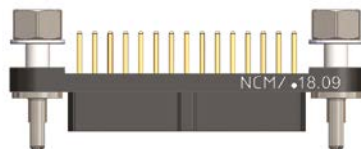
→ MARKING AND POLARIZATION

EXAMPLE

AA (Year):2018
SS (Week):09
. Pin nbr 1

MARKING

NCM = Nicomatic™ brand
AASS = year + week batch



EMM / Main applications

Proven technology / Harsh environment requirements

Need a Miniaturised & Rugged Connector?

EMM

IS YOUR SOLUTION

→ CIVIL AVIATION

Note: Data reliability is a matter of life



Weight saving



Modularity



Space saving

→ DEFENCE

Note: Our products help to make easier maintenance



High vibration



Space saving



Modularity

→ UAV

Note: Saving weight and space



Weight saving



Space saving



Modularity

→ SPACE

Note: There is no wayback for your projects



Weight saving



High altitude

TMC

Outgassing

→ ROBOTICS

Note: High modularity



Shock resistance



Space saving



Modularity

→ MOTOR SPORT

Note: Secure your equipment



Reliability



Shock resistance



High vibration



MIL 83513-G Requirements	EMM Results
Electrical performance requirements	
Dielectric withstanding voltage sea level EIA-364-20C <i>(Performances between contacts)</i> Dielectric withstanding voltage @sea level: 600 V RMS. Connectors shall show no evidence of breakdown or flashover	Dielectric withstanding voltage: 750 V RMS Breakdown voltage: 1000 V RMS Rated voltage: 250 V RMS
Dielectric withstanding voltage high altitude EIA-364-20C <i>(Performances between contacts)</i> Dielectric withstanding voltage @70 000 ft: 150V RMS. Connectors shall show no evidence of breakdown or flashover	Dielectric withstanding voltage @30 000 ft: 540 V RMS Dielectric withstanding voltage @70 000 ft: 480 V RMS Dielectric withstanding voltage @100 000 ft: 465V RMS
Insulation resistance EIA 364-21C Shall not be less than 5 GΩ after temperature cycling and humidity	> 2000 GΩ@ 500V
Contact resistance EIA 364-06C For AWG 24, contact resistance shall be less than 24 mΩ	Less than 8 mΩ
Low level contact resistance EIA 364-06C For AWG 24, shall be less than 25 mΩ	Less than 9 mΩ
Magnetic permeability ASTM A342/A342M Shall not exceed 2 gamma	Less than 2 gamma
Contact current capability (derating) IEC 60512-5-2 Test 5b For PCB connectors, contacts shall be capable of carrying 3.0 A in continuous duty operation from -55°C to 150°C For contacts on cable, derating is depending on the cable. Refer to test results	For 30 pins: Configuration Y/Y: 3,4A @25°C and 2,5A @85°C Configuration Y/V: 3,9A @25°C and 2,5A @85°C
Mechanical features	
Contact engagement and separation forces EIA 364-37B For AWG24, contact engaging shall not exceed 1,67 N and contact separation shall be 0.14N min	Engagement force: 1N max Separation force: 0.15 N
Connector mating and unmating forces EIA 364-13D Shall not exceed a value equal to 2,78 N times the number of contacts	Mating Force: 1.7N max Unmating Force: 0.1N min
Durability MIL-DTL-83513G S4,5,16 Counterpart connectors shall show no mechanical or electrical defects detrimental to the operation of the connector after 500 cycles of mating and unmating	Qualified
Crimp tensile strength EIA 364-08B IPC-WHMA-A-620B Requested: AWG24 > 35.6 N / AWG26 > 22.3 N / AWG28 > 13.4 N AWG30 > 6.7 N NASA-STD 8739.4 Requested AWG24>22.3N / AWG 26>13.5N	AWG 24: 49.98 N min AWG 26: 36.64 N min AWG 28: 16.90 N min AWG 30: 11.30 N min



MIL 83513-G Requirements	EMM Results
Environmental features	
Vibration EIA 364-28E TEST CONDITION III&IV Shall be no interruption of electrical continuity or current flow longer than 1 microsecond MIL-DTL-83513G Test Condition IV: [196.1 m/s ² (20 gn) peak] 10 to 2000 Hz_20 min/cycle_12 cycles/axe (3 axes)	Qualified NB: Configurations up to 30 pins tested successfully @45g
Shock EIA 364-27B TEST CONDITION G Shock severity: MIL-DTL-83513G Test Condition G Peak acceleration:100 g / Normal Duration: 6 ms / Waveform: Saw tooth	Qualified NB: Configurations up to 30 pins tested successfully @160g
Temperature cycling EIA 364-32D Temperature cycling severity: -55°C + 125°C	Temperature cycling severity: -65°C +260°C Max temperature for use in continue: 150°C
Fluid immersion MIL-DTL-83513G §4,5,18 A. Lubricating oil Aircraft turbine engines, synthetic base: 20 hours B. Coolant-dielectric fluid synthetic silicate ester base lubricant (coolanol 25): 1 hour +/- 1 minute	Qualified
Humidity EIA 364-31B - Method IV Ten cycles 25°-65°C, 95%RH, cycle duration: 24 hours (except steps 7a and 7b) Withstanding voltage sea level after Humidity: 360 V RMS Insulation resistance after Humidity: >1 GΩ	Qualified
Salt spray (corrosion) 364-26B TEST CONDITION A Duration: 96 hours @35°C / Salt solution concentration: 5%	Qualified
Thermal vacuum outgassing ASTM E595 (ECSS-Q-ST-70-02C) Total mass loss: TML < 1% of the original mass Max volatile condensable material: CVCM < 0.1% of the original mass Applicable to LCP housing, ring in peek (AWG24 cabling) and backpotting Stycast 2651 MM+catalyst 9	Qualified PEEK (TML 0.18 %, CVCM 0.01 %) / LCP (TML 0.06 %, CVCM 0.01%) / STYCAST 2651 (TML 0.43 %, CVCM 0.01%)
Resistance to soldering heat EIA 364-29C MIL STD 202 method 210F Bath solder T: 260°C - 10 s Iron: 350°C - 5 s	Qualified
Marking MIL-STD-202, method 215 Solvent 1: Isopropyl alcohol, Kerosene (Petroleum ether), Ethylbenzene. Solvent 3: Ethanolamine, 1-methoxy-2-propanol, Water. Solvent 4: Propylene glycol, Monoethanolamine Vigon A600 & N200	Qualified
Fungus resistance 28 days/29°C/HR 90%/ TCA DO 160G	Qualified grade 0 or 1
Radiation Resistance ESCC 22900 Iss.5	Radiation severity: 10 Mrad
High speed performances	
Ethernet 1000 base T USB 3 - SATA 3	See reports on nicomatic.com

EMM

Thru hole and SMT terminations
PCB from 0.8 to 3.5mm

Straight on PCB



Racking or locked fixing hardware

EMM connectors perfectly meet the needs of PCB to PCB configurations: the guiding function of their fixing hardware ease the installation process, while their great wiping length (1.27 mm min) ensures secure mating in the most severe conditions.

Part numbering							
E Series 2 rows	Gender	LF contact type	LF contact nbr	Fixing	Visual	Mating	Visual
E22	1 Male	Y/YL Straight Thru hole 3mm/4.5mm	04 to 60	E10/E10L Male Straight Guiding		E60/E61	
				E50/E50L Female Straight Jackscrew		E01/E02	
				E60/E60L Female Straight Guiding		E10/E11	
	2 Female	T Straight SMT		E01 Jackscrew for Harness		E50/E51	
				E02 Captive Screw for Harness			

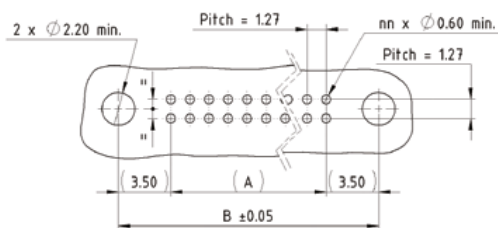
→ FIXING HARDWARE

- INTERCHANGEABLE: all the fixing hardware is compatible with male and female connectors
- Torque: 0.3 Nm
- 2 LENGTHS to meet PCB thicknesses
- Guiding or locking function
- Delivered in bags (except E01 and E02)

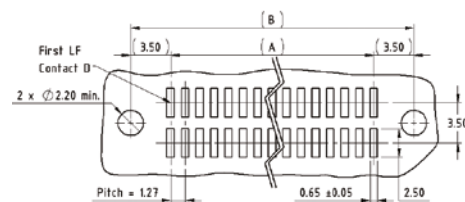


See dimensions P7

→ THRU HOLE TYPE PCB LAYOUT



→ SMT TYPE PCB LAYOUT



Dimension table																													
LF contact number	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
A=Distance between pins (mm)	1.27	2.54	3.81	5.08	6.35	7.62	8.89	10.16	11.43	12.70	13.97	15.24	16.51	17.78	19.05	20.32	21.59	22.86	24.13	25.40	26.67	27.94	29.21	30.48	31.75	33.02	34.29	35.56	36.83
B=Distance between fixings (mm)	8.27	9.54	10.81	12.08	13.35	14.62	15.89	17.16	18.43	19.7	20.97	22.24	23.51	24.78	26.05	27.32	28.59	29.86	31.13	32.4	33.67	34.94	36.21	37.48	38.75	40.02	41.29	42.56	43.83

EMM

Thru hole and SMT terminations
PCB from 0.8 to 3.5mm

90°
on PCB

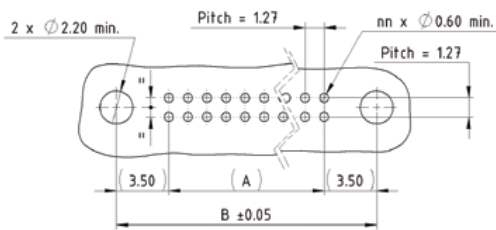


Racking or locked fixing hardware

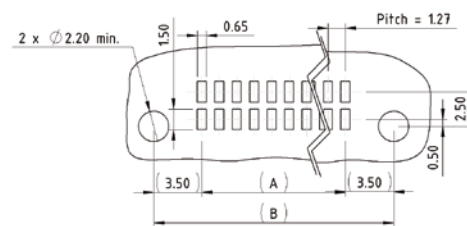
EMM 90° on PCB connectors present an exclusive feature to reinforce robustness. The back shape of the connector brings additional protection and ensures a perfect alignment of the contacts.

Part numbering							
E Series 2 rows	Gender	LF contact type	LF contact nbr	Fixing	Visual	Mating	Visual
E22	1 Male	V/VL 90° Thru hole 3mm/4.5mm	04 to 60	E11/E11L Male 90° Guiding		E60/E61	
	2 Female	R 90° SMT (only male)		E51/E51L Female 90° Jackscrew		E01/E02	
				E61/E61L Female 90° Guiding		E10/E11	

→ THRU HOLE TYPE PCB LAYOUT



→ SMT TYPE PCB LAYOUT



Dimension table																													
LF contact number	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
A=Distance between pins (mm)	1.27	2.54	3.81	5.08	6.35	7.62	8.89	10.16	11.43	12.70	13.97	15.24	16.51	17.78	19.05	20.32	21.59	22.86	24.13	25.40	26.67	27.94	29.21	30.48	31.75	33.02	34.29	35.56	36.83
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EMM

For cabling



Pre wired or to crimp contacts
With or without backpotting

Racking or locked fixing hardware

To crimp or pre cabled, from AWG24 to AWG30 :
whatever your expectation, EMM connectors
will meet your need. Backpotting is recommended
for enhanced protection.

→ TO CRIMP

Part numbering								
E Series 2 rows	Gender	LF contact type	LF contact nbr	Fixing	Visual	Mating	Visual	
E22	1 Male	A AWG 24 Contact Ø0.66 mm with ring in Peek	04 to 60	E01 Jackscrew for Harness		E50/E51		
				E02 Captive Screw for Harness				
	2 Female	B AWG 26 Contact Ø0.66 mm		E10 Male Straight Guiding		E60/E61		
				E50 Female straight Jackscrew		E01/E02		
				G AWG 28-30 Contact Ø0.46 mm	E60 Female straight Guiding		E10/E11	

Contacts A and B are the same ones. The differentiation in the codification comes from the addition of a ring in peek to crimp the AWG 24.

→ SIGNAL CONTACT

Code	Reference Male Female	Type	Cable gauge	Current carrying capacity @25°C	Derating @25°C	Recommended wire	View
A	18224 C19685	To be crimped	AWG 24	Up to 5A	Up to 4A	M16878/ 6-BEE	
	Ring 18281						
B	18224 C19685	To be crimped	AWG 26	Up to 4.5A	Up to 3.5A	M16878/ 6-BDE	
G	18240 C19686						AWG 28-30
		Up to 3.2A	Up to 2.6A	M16878/ 6-BBE			

→ PRE CABLED

Part numbering									
E Series 2 rows	Gender	Signal wire + color #	Shape & potting	LF contact nbr	Fixing	Serie HP / HF Contact	Shielding	Config.	Length
HE22	1 Male	D# AWG 30	P 2mm potting shape	04 to 60	E00 no fixing	∅ If signal (LF) contacts only	Z no	F Fly lead	XXXX
		H# AWG 28						B Back to back	
	2 Female	I# AWG 26	Q 2mm potting shape + potting		E01 Jackscrew for Harness			N Back to back reversed	
		J# AWG 24							

TOOLING

→ SIGNAL(LF) CONTACT CRIMPING TOOL

Reference	Description	View
MH800	Crimping Hand tool DANIELS MH800	
C19040	Positioner for signal contacts	

# WIRE COLOR	
0	Black
1	Brown
2	Red
3	Orange
4	Yellow
5	Green
6	Blue
7	Violet
8	Grey
9	White
R	Rainbow repeated

→ SIGNAL(LF) CONTACT INSERTION/EXTRACTION TOOL

Reference	Description	View
C19039	Insertion & Extraction tool	



Instruction available on the website SP EMM 003

→ TORQUE CONTROL SCREW DRIVER PRE SET TORQUE CONTROL

Reference	Description	View
C19494	Two screwdrivers and 4 bolt tips packaged in box	
18034	Preset Screwdriver 0.2 Nm (Yellow)	
18035	Preset Screwdriver 0.3 Nm (Blue)	
18040	Internal hex 2 tip (For E01 and E02)	
18043	Specific socket tip (For all hardware except E01 and E02)	
18665	Slot head tip with clearance (For all hardware except E01 and E02)	
C19495	Screw-fastening aid (For straight fixing hardware)	

→ BACKPOTTING INFO

Nicomatic performs its backpotting with Skycast 2651MM and Catalyst 9 (10%)