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RELAY, ELECTROMAGNETIC, LATCHING, 28VDC, 1A, 2PDT, 1/6 CRYSTAL CAN

ESCC Detail Specification No. 3602/019

Issue 7 June 2021



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DOCUMENTATION CHANGE NOTICE

(Refer to https://escies.org for ESCC DCR content)

DCR No.	CHANGE DESCRIPTION
1424	Specification updated to incorporate changes per DCR.



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1 **GENERAL**

1.1 <u>SCOPE</u>

This specification details the ratings, physical and electrical characteristics, and test and inspection data for the component type variants and/or the range of components specified below. It supplements the requirements of, and shall be read in conjunction with, the ESCC Generic Specification listed under Applicable Documents.

1.2 <u>APPLICABLE DOCUMENTS</u>

The following documents form part of this specification and shall be read in conjunction with it:

(a) ESCC Generic Specification No. 3602.

1.3 TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESCC Basic Specification No. 21300 shall apply.

1.4 THE ESCC COMPONENT NUMBER AND COMPONENT TYPE VARIANTS

1.4.1 The ESCC Component Number

The ESCC Component Number shall be constituted as follows:

Example: 36020190126V

• Detail Specification Reference: 3602019

Component Type Variant Number: 01 (as required)

• Characteristic code: Rated Coil Voltage (26.5Vdc): 26V (as required)

1.4.1.1 Characteristics and/or Ratings Codes

Characteristics and/or ratings to be codified as part of the ESCC Component Number shall be as follows:

(a) Rated Coil Voltage expressed by means of the following codes:

Rated Coil Voltage (Vdc)	Code
26.5	26V
12	12V
6	6V



1.4.2 <u>Component Type Variants and Range of Components</u>

The component type variants and range of components applicable to this specification are as follows:

Variant Number	Case and Terminal Description (Note 1)	Rated Coil Voltage (Vdc)	Weight max (g)
01	Plain Case (No Mount) Solder Pin Terminals	26.5, 12, 6	2.6
02	Plain Case (No Mount) Long Lead Terminals	26.5, 12, 6	3.2
04	Raised Vertical Flange Mount Solder Pin Terminals	26.5, 12, 6	2.9
05	Raised Vertical Flange Mount Long Lead Terminals	26.5, 12, 6	3.5
06	Raised Vertical Flange Mount Solder Hook Terminals	26.5, 12, 6	2.9
07	Flush Vertical Flange Mount Solder Pin Terminals	26.5, 12, 6	2.9
10	Horizontal Flange Mount Long Lead Terminals	26.5, 12, 6	3.5
11	Horizontal Flange Mount Solder Hook Terminals	26.5, 12, 6	2.9

NOTES:

1. See Para. 1.6.



1.5

MAXIMUM RATINGS

The maximum ratings shall not be exceeded at any time during use or storage.

Maximum ratings shall only be exceeded during testing to the extent specified in this specification and when stipulated in Test Methods and Procedures of the ESCC Generic Specification.

Characteristics	Symbols	Maximum Ratings	Units	Remarks
Coil Voltage Range	Vcr	25 to 32 11 to 15 5.5 to 7.5	Vdc	Rated Coil Voltage: 26.5Vdc Rated Coil Voltage: 12Vdc Rated Coil Voltage: 6Vdc
Rated Resistive Load Contact Current	Icr	1	Α	28Vdc resistive Note 1
Rated Inductive Load Contact Current	IcL	200	mA	28Vdc inductive Inductance: 320mH Note 1
Overload Current	IOVERLOAD	2	А	28Vdc resistive
Operating Temperature Range	Тор	-65 to +125	°C	T _{amb}
Storage Temperature Range	T _{stg}	-65 to +125	°C	T _{amb}
Soldering Temperature	T _{sol}	+260	°C	Note 2

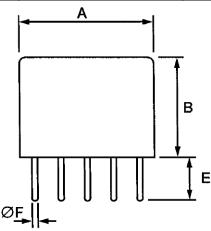
NOTES:

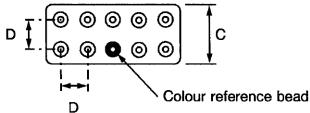
- 1. Relays should not be used in change-over mode where the potential difference between stationary contacts is greater than 10V and the switched current is greater than 100mA.
- 2. Duration 10 seconds maximum at a distance not less than 1.5mm from the device body. The same terminal shall not be resoldered until 3 minutes have elapsed.



1.6 PHYSICAL DIMENSIONS AND TERMINAL IDENTIFICATION

Plain Case (No Mount) and Solder Pin Terminals (Variant 01) 1.6.1

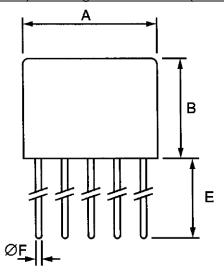


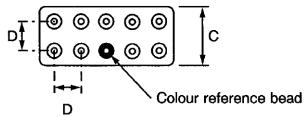


-			
Symbols	Dimensions (mm)		
	Min	Max	
А	-	13	
В	-	10.4	
С	-	6.1	
D	2.41	2.67	
E	4.4	5.2	
ØF	0.45	0.55	



1.6.2 Plain Case (No Mount) and Long Lead Terminals (Variant 02)



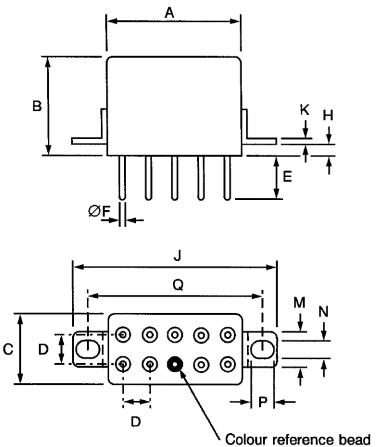


Symbols	Dimensions (mm)	
	Min	Max
Α	-	13
В	-	10.4
С	-	6.1
D	2.41	2.67
E	37	39
ØF	0.45	0.55

NOTES:



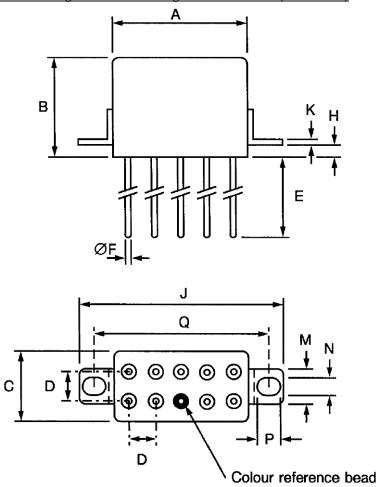
1.6.3 Raised Vertical Flange Mount and Solder Pin Terminals (Variant 04)



Colour relevance			
Symbols	Dimensions (mm)		
	Min	Max	
А	-	13	
В	-	10.4	
С	-	6.1	
D	2.41	2.67	
E	4.4	5.2	
ØF	0.45	0.55	
Н	3	3.4	
J	-	22.85	
K	0.3	0.5	
M	4.5	4.9	
N	2.15	2.65	
Р	3.1	3.3	
Q	17.35	18.35	



1.6.4 Raised Vertical Flange Mount and Long Lead Terminals (Variant 05)

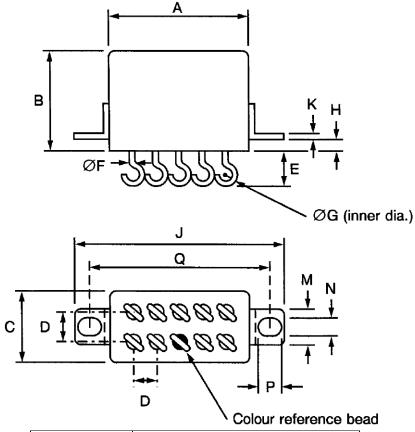


Symbols	Dimensions (mm)		
	Min	Max	
А	-	13	
В	-	10.4	
С	-	6.1	
D	2.41	2.67	
E	37	39	
ØF	0.45	0.55	
Н	3	3.4	
J	-	22.85	
K	0.3	0.5	
M	4.5	4.9	
N	2.15	2.65	
Р	3.1	3.3	
Q	17.35	18.35	

NOTES



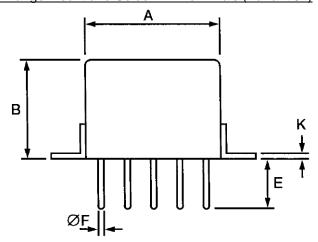
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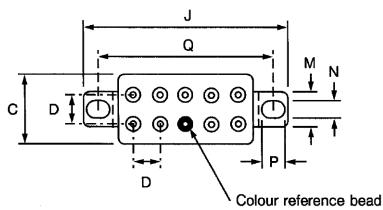


Symbols	Dimensions (mm)	
	Min	Max
А	-	13
В	-	10.4
С	-	6.1
D	2.41	2.67
E	2.9	3.9
ØF	0.45	0.55
ØG	-	0.9
Н	3	3.4
J	-	22.85
K	0.3	0.5
М	4.5	4.9
N	2.15	2.65
Р	3.1	3.3
Q	17.35	18.35



1.6.6 Flush Vertical Flange Mount and Solder Pin Terminals (Variant 07)



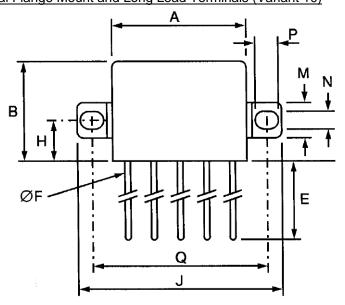


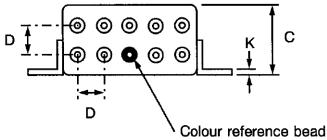
Symbols	Dimensions (mm)		
	Min	Max	
А	-	13	
В	-	10.4	
С	-	6.1	
D	2.41	2.67	
Е	4.4	5.2	
ØF	0.45	0.55	
J	-	22.85	
K	0.3	0.5	
М	4.5	4.9	
N	2.15	2.65	
Р	3.1	3.3	
Q	17.35	18.35	

NOTES:



1.6.7 <u>Horizontal Flange Mount and Long Lead Terminals (Variant 10)</u>



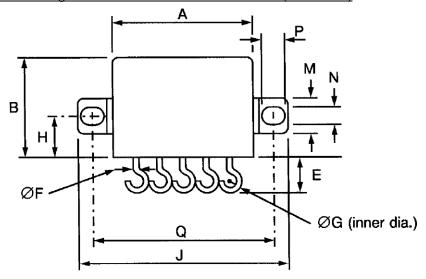


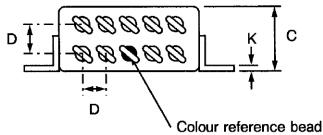
Colour reference			
Symbols	Dimensions (mm)		
	Min	Max	
А	-	13	
В	-	10.4	
С	-	6.1	
D	2.41	2.67	
Е	37	39	
ØF	0.45	0.55	
Н	5.2	5.6	
J	-	22.85	
K	0.3	0.5	
M	4.5	4.9	
N	2.15	2.65	
Р	3.1	3.3	
Q	17.35	18.35	

NOTES:



1.6.8 Horizontal Flange Mount and Solder Hook Terminals (Variant 11)





Symbols	Dimensions (mm)			
	Min	Max		
А	-	13		
В	-	10.4		
С	-	6.1		
D	2.41	2.67		
E	2.9	3.9		
ØF	0.45	0.55		
ØG	-	0.9		
Н	5.2	5.6		
J	-	22.85		
K	0.3	0.5		
M	4.5	4.9		
N	2.15	2.65		
Р	3.1	3.3		
Q	17.35	18.35		

NOTES:



1.7 <u>FUNCTIONAL DIAGRAM</u>

NOTES:

- 1. As viewed from the terminal side.
- 2. Individual terminal designations are for reference purposes only.

1.8 <u>MATERIALS AND FINISHES</u>

1.8.1 Case

Copper nickel, hermetically sealed. Tin-lead alloy plating may be used.

1.8.2 Terminals

The lead material and finish shall by type D3, D4 or D19 in accordance with the requirements of ESCC Basic Specification No. 23500.

2 **REQUIREMENTS**

2.1 GENERAL

The complete requirements for procurement of the components specified herein are as stated in this specification and the ESCC Generic Specification. Permitted deviations from the Generic Specification, applicable to this specification only, are listed below.

Permitted deviations from the Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC requirement and do not affect the component's reliability, are listed in the appendices attached to this specification.

2.1.1 <u>Deviations from the Generic Specification</u>

None.

2.2 MARKING

The marking shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and as follows.

The information to be marked on the component shall be:

- (a) The ESCC qualified components symbol (for ESCC qualified components only).
- (b) The ESCC Component Number (see Para. 1.4.1).
- (c) Traceability information.



2.3 <u>TERMINAL STRENGTH</u>

The terminals of all Variants are defined as rigid.

The test conditions for Terminal Strength, tested as specified in the ESCC Generic Specification, shall be as follows:

(a) Pull Test

Applied Force: 10N

(b) Bend Test (Test Condition C)

Load: 5N

2.4 <u>ELECTRICAL MEASUREMENTS AT ROOM, HIGH AND LOW TEMPERATURES</u>

Electrical measurements shall be performed at room, high and low temperatures. Consolidated notes are given in Para. 2.4.3.

2.4.1 Room Temperature Electrical Measurements

The measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

Characteristics Symbols		Test Method and Conditions	Rated Coil	L	Units	
		Conditions	Voltage (Vdc)	Min	Max	
Latch Voltage	UL	ESCC No. 3602 Note 1	26.5 12 6	7 3.5 1.5	14 7 3.5	V
Reset Voltage	UR	ESCC No. 3602 Note 1	26.5 12 6	7 3.5 1.5	14 7 3.5	V
Latch Time	t∟	ESCC No. 3602	All	-	3	ms
Reset Time	t _R	ESCC No. 3602	All	-	3	ms
Bounce Time	t _B	ESCC No. 3602	All	-	1.5	ms
Insulation Resistance	Rı	ESCC No. 3602 V _{TEST} = 100Vdc	All	10	-	GΩ
Voltage Proof	VP	ESCC No. 3602	All	500	-	Vrms
(Test Voltage)		Maximum Leakage Current I _{LVP} = 1mA		350 (Note 2)	-	
Voltage Proof Leakage Current	I _{LVP}	ESCC No. 3602 Note 3	All	-	1	mA
Contact Voltage Drop	V _D	ESCC No. 3602 I _{TEST} = 100mA max	All	-	0.1 x ITEST	V
Coil Resistance	R _B	ESCC No. 3602 Both Coils	26.5 12 6	945 203 51	1155 243 61	Ω



2.4.2 <u>High and Low Temperatures Electrical Measurements</u>

Characteristics			Rated Coil	1	Limits	Units
		Conditions	Voltage (Vdc)	Min	Max	
Latch Voltage	UL	ESCC No. 3602 T _{amb} = +125 (+0 -5)°C and -65 (+5 -0)°C Note 1	26.5 12 6	- - -	18 9 4.5	V
Reset Voltage	UR	ESCC No. 3602 T _{amb} = +125 (+0 -5)°C and -65 (+5 -0)°C Note 1	26.5 12 6		18 9 4.5	V
Latch Time	t∟	ESCC No. 3602 T _{amb} = +125 (+0 -5)°C and -65 (+5 -0)°C	All	-	3	ms
Reset Time	t _R	ESCC No. 3602 T _{amb} = +125 (+0 -5)°C and -65 (+5 -0)°C	All	-	3	ms
Bounce Time	tв	ESCC No. 3602 T _{amb} = +125 (+0 -5)°C and -65 (+5 -0)°C	All	-	1.5	ms
Insulation Resistance	Rı	ESCC No. 3602 T _{amb} = +125 (+0 -5)°C V _{TEST} = 100Vdc	All	100	-	ΜΩ
Contact Voltage Drop	V _D	ESCC No. 3602 T _{amb} = +125 (+0 -5)°C and -65 (+5 -0)°C I _{TEST} = 100mA max	All	-	0.1 x ITEST	V

2.4.3 <u>Notes to Electrical Measurements Tables</u>

- 1. The coil voltage rise time shall be less than $0.1t_L$ or $0.1t_R$. The coil voltage shall be maintained for a minimum duration of $10t_L$ or $10t_R$.
- 2. Points of application (350V):
 - Between open contacts, coil de-energised.
 - Between open contacts, coil energised with Rated Coil Voltage.
- 3. Measured during Voltage Proof test.

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2.5 PARAMETER DRIFT VALUES

Parameter Drift Values shall be measured as specified in the ESCC Generic Specification.

Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

The test methods and test conditions shall be as per the corresponding test defined in Para. 2.4.1 Room Temperature Electrical Measurements.

The corresponding absolute limit values for each characteristic shall not be exceeded.

Characteristics	Symbols		Units		
		Drift Value	Absolute		
		Δ	Min	Max	
Latch Voltage	U∟	Note 1	Note 2	Note 2	V
Reset Voltage	UR	Note 1	Note 2	Note 2	V

NOTES:

- 1. Drift Value (Δ) limits are not specified. Drift Values shall be recorded for information purposes only.
- 2. The limit specified in Para. 2.4.1 shall apply.

2.6 INTERMEDIATE AND END-POINT ELECTRICAL MEASUREMENTS

Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

Unless otherwise specified the test methods and test conditions shall be as per the corresponding test defined in Para. 2.4.1 Room Temperature Electrical Measurements.

Test Reference per	Characteristics	Symbols	L	imits	Units
ESCC No. 3602	(Note 1)		Min	Max	
Thermal Shock	During 5th Cycle				
	Latch Voltage	U∟	N	lote 2	V
	Reset Voltage	UR	Note 2		V
	Latch Time	t∟	Note 2		ms
	Reset Time	t _R	Note 2		ms
	Final Measurements				
	Voltage Proof	VP	Note 3		Vrms
	Voltage Proof Leakage Current	I _{LVP}	٨	lote 3	mA



Test Reference per	Characteristics	Symbols	L	Limits Min Max	
ESCC No. 3602	(Note 1)		Min		
Low Level Sine	Final Measurements				
Vibration	Latch Voltage	U∟	N	ote 3	V
	Latch Voltage Drift	ΔU _L /U _L	N	ote 1	%
	Reset Voltage	U _R	N	ote 3	V
	Reset Voltage Drift	ΔU _R /U _R	Ν	ote 1	%
Random Vibration	Final Measurements				
	Latch Voltage	UL	Ν	ote 3	V
	Latch Voltage Drift	∆U∟/U∟	Ν	ote 1	%
	Reset Voltage	U _R	Ν	ote 3	V
	Reset Voltage Drift	ΔU _R /U _R	Ν	ote 1	%
High Level Sine	Final Measurements				
Vibration	Latch Voltage	U∟	N	ote 3	V
	Latch Voltage Drift	ΔU _L /U _L	N	ote 1	%
	Reset Voltage	U _R	Ν	ote 3	V
	Reset Voltage Drift	ΔU _R /U _R	N	ote 1	%
Low Level Mechanical	Final Measurements				
Shock	Contact Voltage Drop	V _D	Ν	ote 3	V
	Latch Voltage	UL	Ν	ote 3	V
	Latch Voltage Drift	∆U∟/U∟	Ν	ote 1	%
	Reset Voltage	U_R	N	ote 3	V
	Reset Voltage Drift	$\Delta U_R/U_R$	Ν	ote 1	%
	Voltage Proof	VP	N	ote 3	Vrms
	Voltage Proof Leakage Current	I _{LVP}	N	ote 3	mA
High Level	Final Measurements				
Mechanical Shock	Contact Voltage Drop	V _D	Ν	ote 3	V
	Latch Voltage	UL	Ν	ote 3	V
	Latch Voltage Drift	∆U∟/U∟	Ν	ote 1	%
	Reset Voltage	U_R	N	ote 3	V
	Reset Voltage Drift	ΔU _R /U _R	N	ote 1	%
	Voltage Proof	VP	N	ote 3	Vrms
	Voltage Proof Leakage Current	I _{LVP}	N	ote 3	mA



Test Reference per	Characteristics	Symbols	L	_imits	Units
ESCC No. 3602	(Note 1)		Min	Max	
Resistance to	Final Measurements				
Soldering Heat	Insulation Resistance	Rı	N	lote 3	GΩ
	Contact Voltage Drop	V_D	N	lote 3	V
	Latch Voltage	U∟	N	lote 3	V
	Reset Voltage	U _R	N	lote 3	V
	Coil Resistance	R _B	N	lote 3	Ω
Low Level Life	Final Measurements				
	Contact Voltage Drop	V_D	-	0.2 x I _{TEST}	V
	Insulation Resistance	Rı	5000	-	МΩ
	Voltage Proof	VP	N	lote 3	Vrms
	Voltage Proof Leakage Current	I _{LVP}	N	lote 3	mA
	Latch Voltage	U∟	N	lote 3	V
	Latch Voltage Drift	ΔUL/UL	N	lote 1	%
	Reset Voltage	U _R	N	lote 3	V
	Reset Voltage Drift	ΔU _R /U _R	N	lote 1	%
	Latch Time	t∟	N	lote 3	ms
	Reset Time	t _R	N	lote 3	ms
	Bounce Time	t _B	N	lote 3	ms
	Coil Resistance	R _B	N	lote 3	Ω
Resistive Life	During Monitoring				
	Contact Voltage Drop	V _D	-	2.8	V
	Final Measurements				
	Contact Voltage Drop	V _D	-	0.2 x I _{TEST}	V
	Insulation Resistance	Rı	5000	-	МΩ
	Voltage Proof	VP	N	lote 3	Vrms
	Voltage Proof Leakage Current	I _{LVP}	N	lote 3	mA
	Latch Voltage	UL	N	lote 3	V
	Latch Voltage Drift	∆U∟/U∟	N	lote 1	%
	Reset Voltage	U _R	N	lote 3	V
	Reset Voltage Drift	ΔU _R /U _R	N	lote 1	%
	Latch Time	t∟	N	lote 3	ms
	Reset Time	t _R	N	lote 3	ms
	Bounce Time	t _B	١	lote 3	ms
	Coil Resistance	Rв	N	lote 3	Ω



Test Reference per	Characteristics	Symbols	L	imits	Units
ESCC No. 3602	(Note 1)		Min Max		
Coil Life	During Step 1 of each Cycle				
	Contact Voltage Drop	V _D	N	lote 3	V
	Coil Resistance	R _B	N	lote 3	Ω
	During Step 3 of 1st Cycle				
	Contact Voltage Drop	V _D	N	lote 2	V
	Latch Time	t∟	N	lote 2	ms
	Reset Time	t _R	N	lote 2	ms
	During Steps 4 & 5 of 4th Cycle				
	Latch Voltage	UL	Note 2		V
	Reset Voltage	UR	Note 2		V
	Final Measurements				
	Voltage Proof	VP	N	lote 3	Vrms
	Voltage Proof Leakage Current	I _{LVP}	N	lote 3	mA
	Insulation Resistance	Rı	N	lote 3	GΩ
	Contact Voltage Drop	V _D	N	lote 3	V
	Coil Resistance	Rв	N	lote 3	Ω
	Latch Time	t∟	N	lote 3	ms
	Reset Time	t _R	N	lote 3	ms
	Bounce Time	t _B	N	lote 3	ms



Test Reference per	Characteristics	Symbols	L	_imits	Units
ESCC No. 3602	(Note 1)		Min	Max	
Intermediate Current	During Monitoring				
	Contact Voltage Drop	V _D	-	300	mV
	E: 1M				
	Final Measurements	_	5000	ĺ	
	Insulation Resistance	R _I	5000	-	ΜΩ
	Voltage Proof	VP		Note 3	Vrms
	Voltage Proof Leakage Current	I _{LVP}		Note 3	mA
	Latch Voltage	U∟		Note 3	V
	Latch Voltage Drift	ΔUL/UL	N	Note 1	%
	Reset Voltage	U _R	١	Note 3	V
	Reset Voltage Drift	$\Delta U_R/U_R$	١	Note 1	%
	Latch Time	t∟	١	Note 3	ms
	Reset Time	t R	N	Note 3	ms
	Bounce Time	t _B	N	Note 3	ms
	Coil Resistance	Rв	١	Note 3	Ω
	Contact Voltage Drop	V_D	ı	0.2 x I _{TEST}	V
Overload	During Monitoring				
	Contact Voltage Drop	V _D	-	1.4	V
	Final Measurements			l	.,
	Contact Voltage Drop	V_D	-	0.2 x I _{TEST}	V
	Insulation Resistance	Rı	5000	-	ΜΩ
	Voltage Proof	VP		Note 3	Vrms
	Voltage Proof Leakage Current	ILVP		Note 3	mA
	Latch Voltage	U∟	١	Note 3	V
	Latch Voltage Drift	∆U∟/U∟	١	Note 1	%
	Reset Voltage	U _R	١	Note 3	V
	Reset Voltage Drift	ΔU _R /U _R	١	Note 1	%
	Latch Time	t∟	N	Note 3	ms
	Reset Time	t _R	١	Note 3	ms
	Bounce Time	t _B	١	Note 3	ms
	Coil Resistance	Rв	N	Note 3	Ω





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NOTES:

- 1. Parameter Drift shall be calculated referenced to the measurement immediately prior to the test in question. An additional initial measurement may be performed prior to the test in question if considered necessary. Drift limits are not specified. Drift Values shall be recorded for information purposes only.
- 2. The limits specified in Para. 2.4.2, as applicable to the same test temperature, shall apply.
- 3. The limits specified in Para. 2.4.1 shall apply.

2.7 RUN-IN CONDITIONS

The test conditions for Run-in, tested as specified in the ESCC Generic Specification, shall be as follows:

(a) Test Temperature: +22 ±3°C.





APPENDIX A AGREED DEVIATIONS FOR LEACH INTERNATIONAL EUROPE (F)

ITEMS AFFECTED	DESCRIPTION OF DEVIATIONS
Para. 2.1.1 Deviations from the	High Level Sine Vibration: Not Applicable
Generic Specification: Qualification and Periodic Tests	High Level Mechanical Shock: Not Applicable
(Chart F4)	Chart F4: Coil Life subgroup test sequence (under Endurance Subgroup 1):
	Coil Life and the subsequent tests shall only be performed for Qualification. They are not required for Periodic Testing except in the case of any significant change to the design.