Plastic connector for a high current applications

EM52M/40M/30M Series

■Features

1. The robust lightweight, high current design is enabled by using high-quality plastic material which is resistant to rough handling.

2. Quick and secure push-on bayonet lock
The push-on bayonet locking mechanism enables complete locking in one quick mating action.

3. Multi-surface contact spring design
High-current is achieved by using the multi-surface contact spring design.

4. Standard crimp tool for easy crimp connection
Contacts can be crimped by using a JIS Standard-meeting crimp tool (JIS C 9711).

5. Available in a water-proof version
It is available with water-proofness by using a cable gland (Note 1).

6. Finger protection design
Complies with the electric shock proof specification (IP2X). (Note 2)

7. TÜV, UL
EM40, EM30 UL registered. (Note 3)
EM52M : TÜV registered
: UL application pending

8. Meets RoHS standards

Note 1 : Keigland, manufactured by SANKEI MANUFACTURING Co., Ltd.
Note 2 : Applies only to plug side in the case of EM40M and 30M.
Note 3 : EM40M and 30M are only applying for UL.
Please confirm specifications at time of delivery.

■Product Specifications

	Product		EM52M	EM40M	EM30M
Ratings	Number of contacts		4 pos.	1 pos.	1 pos.
	Rated voltage		AC, DC 1000V AC 600V, DC 750V (TÜV)	AC, DC 1000V AC, DC 600V (UL)	
	Rated current	Water-proof	TÜV : 100A (38SQ) 80A (22SQ) General : 130A (38SQ) (Ambient temperature 25°C)	UL : 300A General : 410A (Ambient temperature 25°C)	UL : 150A General : 175A (Ambient temperature 25°C)
		Non-water-proof	TÜV : 100A (38SQ) 80A (22SQ) General : 140A (38SQ) (Ambient temperature 25°C)	UL : 300A General : 450A (Ambient temperature 25°C)	UL : 150A General : 200A (Ambient temperature 25°C)
	Operating temperature range		-25°C to +105°C (Non-water-proof specification) -20°C to 90°C (Water-proof specification) (Includes temperature rise due to current flow.)		
	Storage temperature range		-10°C to +60°C		

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Item	Specifications	Conditions
1. Contact resistance	0.5mΩ or less (EM52M) 0.3mΩ or less (EM40M) 0.6mΩ or less (EM30M)	Measured at DC 1A
2. Insulation resistance	1000MΩ or more	Measured at DC 500V
3. Withstanding voltage	No flashover or breakdown	Apply AC 2200V for 1 minute.
4. Mating cycles	Contact resistance 1mΩ or less (EM52M) 0.8mΩ or less (EM40M) 0.8mΩ or less (EM30M)	50 times of repeated operation
5. Vibration resistance	No electrical discontinuity of 10μs or more	10 to 55 to 10 Hz/cycle, half amplitude of 0.75mm, 5 minutes/cycle, 10 cycles in each of the three axial directions (EM52M Non-water-proof specification)
		10 to 500Hz/cycle, half amplitude 0.75mm 3 hours in 3 axial directions (MIL-STD-1344 Method 2005 Condition Ⅱ) (EM52M Water-proof specification, EM40M, EM30M)
6. Shock resistance	No electrical discontinuity of 10μs or more	Acceleration : 490 m/s², duration : 11 ms, 6 directions, 3 cycles for each
7. Temperature cycles	Insulation resistance : Minimum of 1000MΩ	-40℃: 30 minutes → Room temperature : 2 to 3 minutes → +105℃ : 30 minutes → Room temperature : 2 to 3 minutes, 5 cycles
8. Humidity resistance	Insulation resistance : Minimum of 10MΩ (at high humidity) Minimum of 100MΩ (dry environment)	Left at a temperature of 40℃ and in humidity of 90 to 95% for 96 hours.
9. Waterproof	No water intrusion inside connector	Submerged in 1m water depth for 0.5 days in mated condition.

■Materials / Finish

Component	Materials	Color/Finish	Remarks
Insulator	PBT, PBT Alloy Resin	Black	UL94V-0
Contact	Copper	Silver plated	———
Contact spring	Copper alloy	Silver plated	———
Packing	Fluorosilicone rubber	Black	———
O-ring	Nitrile rubber	Black	———

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■Product Number Structure

Refer to the chart below when determining the product specifications from the product number.
Please select from the product numbers listed in this catalog when placing orders.

● **Plug**

EM ** M – * B P – * P C A –* (**)
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬

● **Receptacle**

EM ** M – * B R – * S C A –* (**)
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬

● **Crimp contact (male)**

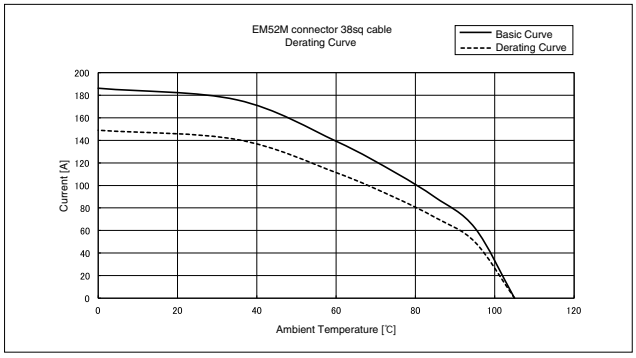
EM 52 M – P C * – 1 * 2 (**)
❶ ❷ ❸ ❽ ❾ ⓭ ⓮ ⓯ ⓰ ⓬

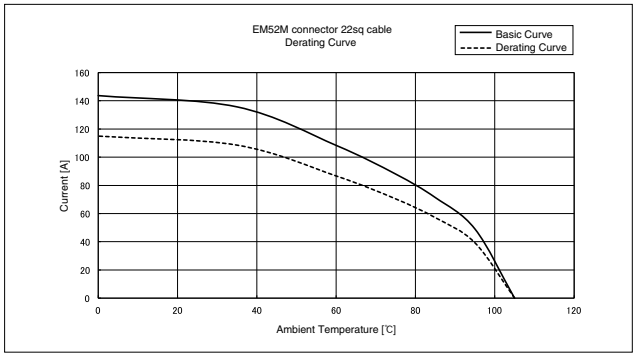
● **Crimp contact (female)**

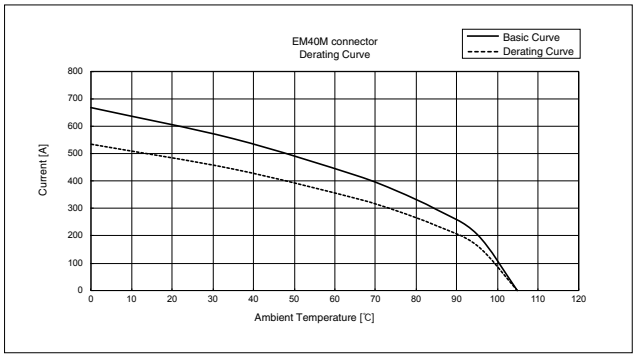
EV1 – S C * – 1 * 2 (**)
❶ ❽ ❾ ⓭ ⓮ ⓯ ⓰ ⓬

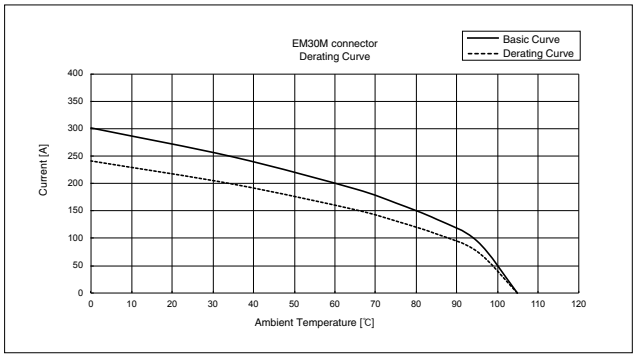
❶ Series name : EM, EV	❾ Contact connection method : C=Crimp connection
❷ Shell size : 52, 40, 30	❿ Mating guide indication: A, B, C, D
❸ Style [1] : M=Mold type	⓫ Package : Unmarked=standard, K=contact, retainer or sleeve shipped in a single package
❹ Style [2] : W=Water-proof type, Unmarked=Non-water-proof type	⓬ Special specification: Alternate options
❺ Lock type : B= Bayonet lock	⓭ Contact shape : Unmarked=standard (with connection holes), 2=without connection holes
❻ Connector type : P=plug, R=receptacle, J=jack	⓮ Contact form : 1=Loose piece contact
❼ Number of contacts	⓯ Connection section : 1=22SQ-compliant, 3=38SQ-compliant
❽ Connector gender : P=Male contact, S=Female contact	⓰ Plating class : 2=Silver plating

[Reference] Derating curve









Operation below the derating curve (dotted line) is recommended.

Note : Derating curve could vary depending on cable type and measurement even under the same conditions.
Therefore, the data noted above are reference values, not connector specifications.

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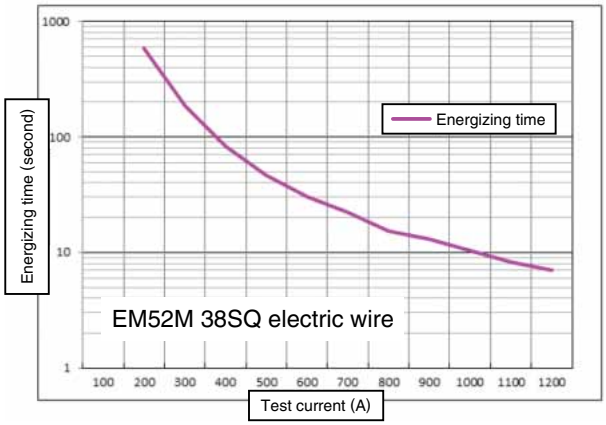
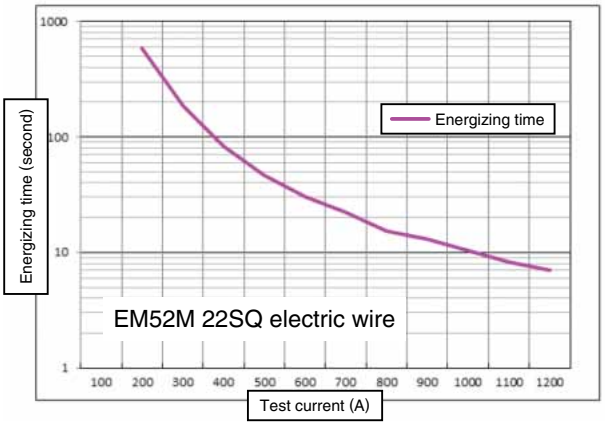
[Reference] Continuous energizing current graph (Current-Time graph)

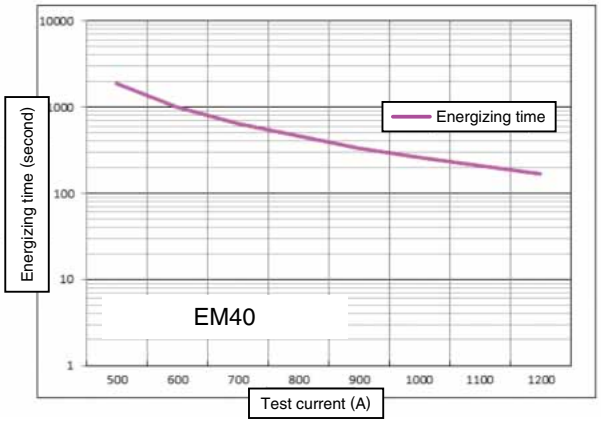
[Temperature rise value 45℃] Energizing time
(average value of all samples)



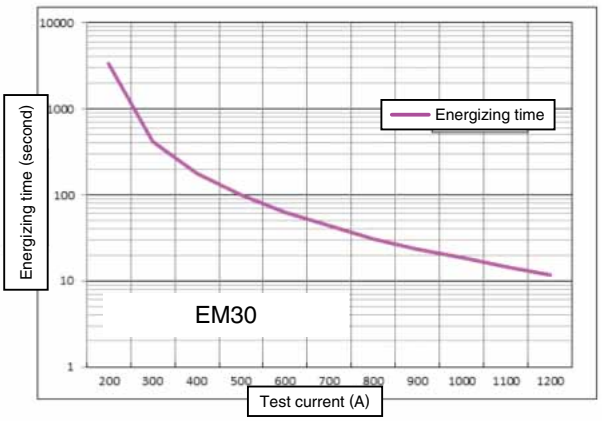
[Temperature rise value 45℃] Energizing time
(average value of all samples)



[Temperature rise value 45℃] Energizing time
(average value of all samples)



[Temperature rise value 45℃] Energizing time
(average value of all samples)



Note : The continuous energizing current graph is reference data used for current values exceeding the rated values for a short time.

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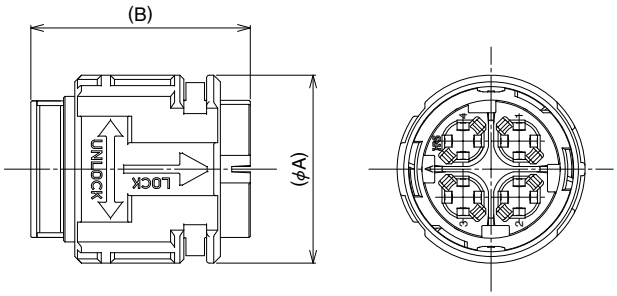
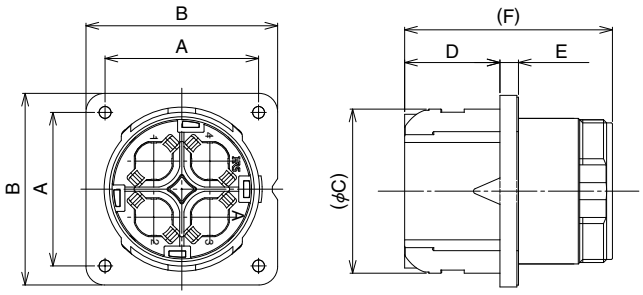
■Plug



Unit : mm

Part No.	HRS No.	A	B	Remarks
EM52M-BP-4PCA	138-0046-2	71	51.6	For non-water-proof type
EM52M-WBP-4PCA	138-0035-6			For water-proof type
EM40M-WBP-1PCA-K	138-0070-0	53.2	39.5	For water-proof type, Contact and sleeve shipped in a single package
EM40M-BP-1PCA-K	138-0072-0			For non-water-proof type, Contact and retainer shipped in a single package
EM30M-WBP-1PCA-K	138-0074-0	40.6	26.7	For water-proof type, Contact and sleeve shipped in a single package
EM30M-BP-1PCA-K	138-0076-0			For non-water-proof type, Contact and retainer shipped in a single package

■Receptacle



Unit : mm

Part No.	HRS No.	A	B	C	D	E	F	Remarks
EM52M-BR-4SCA	138-0050-0	58	72.4	62	36	7	78.5	For non-water-proof type
EM52M-WBR-4SCA	138-0036-9							For water-proof type
EM40M-WBR-1SCA-K	138-0071-0	45.96	56	46.5	27	6	75.7	For water-proof type, Contact and sleeve shipped in a single package
EM40M-BJ-1SCA-K	138-0073-0							For non-water-proof type, Contact and retainer shipped in a single package
EM30M-WBR-1SCA-K	138-0075-0	36.77	46	35.2	21.6	5	57.8	For water-proof type, Contact and sleeve shipped in a single package
EM30M-BJ-1SCA-K	138-0077-0							For non-water-proof type, Contact and retainer shipped in a single package

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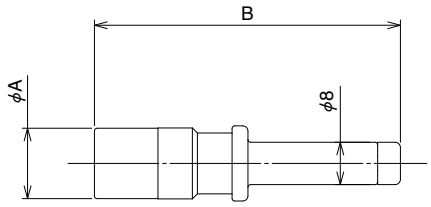
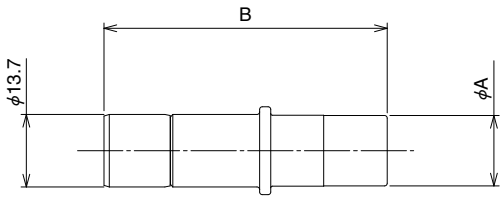
■Male contact



Unit : mm

Part No.	HRS No.	Conductor area	A	B	Remarks
EM52M-PC2-132	138-0006-0	26.66 to 42.42mm²	13.3	57.8	Cap : Gray
EM52M-PC-112	138-0012-0	16.78 to 26.66mm²	11.5	50.8	Cap : Black

■Female contact



Unit : mm

Part No.	HRS No.	Conductor area	A	B	Remarks
EV1-SC2-132(03)	139-0012-7 03	26.66 to 42.42mm²	13.3	53.5	Cap : Gray
EV1-SC2-112(03)	139-0013-0 03	16.78 to 26.66mm²	11.5	50.5	Cap : Black

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◆Strain Relief

Note : This product is manufactured by SANKEI MANUFACTURING Co., Ltd.

Part No.	HRS No.	Applicable connector	Remarks
E2KD3636	—	EM52M	When using a 38mm² wire
E2KD3236	—	EM52M	When using a 22mm² wire
E2KD2428	—	EM40M	—
E2KD1620	—	EM30M	—

◆Multiple packing

Note : This product is manufactured by SANKEI MANUFACTURING Co., Ltd.

Part No.	HRS No.	Applicable connector	Outer diameter of applicable wire	Applicable Strain Relief
EMGP36-11×4P	—	EM52M	ϕ10 to 11mm	E2KD3636
EMGP36-12×4P	—		ϕ11 to 12mm	
EMGP36-13×4P	—		ϕ12 to 13mm	
EMGP32-9×4P	—		ϕ8 to 9mm	E2KD3236
EMGP32-10×4P	—		ϕ9 to 10mm	
EMGP32-11×4P	—		ϕ10 to 11mm	

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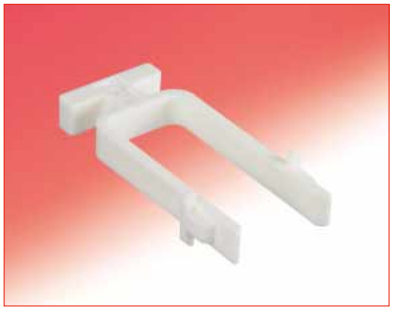
◆Applicable tools

Items	Part No.	HRS No.	Remarks
Contact extraction tool	EM52M-PC-TP	150-0261-9	Male contact extraction tool
	EM52M-SC-TP	150-0262-1	Female contact extraction tool
Manual hydraulic type crimp tool	HT111/9H-60	902-1515-2	Equivalent product : 9H-60 made by IZUMI Product Company
Electric hydraulic type crimp tool	————	————	Recommendation : REC-Li150 made by IZUMI Product Company

■ Contact extraction tool EM52M-PC-TP

■ Contact extraction tool EM52M-SC-TP



■ Manual hydraulic type crimp tool 9H-60

■ Electric hydraulic type crimp tool REC-Li150

◆Safety Precautions

⚠ Warning

- **Do not touch the exposed conductor while it is energized. Failing to follow this warning may cause an electric shock and injury. ⚠**
- **The power should be in the OFF position when inserting or extracting this connector.**
- **After mating this connector, perform a light pull on the cable to ensure that it has been correctly mated and the locking process will hold it in place. If it is not mated correctly, then the cable will be removed. An incomplete mate can cause disconnection, contact failure and a significant danger threat.**

⚠ Caution

- **This connector was designed to be used in a stable and stationary environment, do not try to operate this connector where vibrations will occur.**
- **Please only use Hirose approved contacts. Using unapproved contacts can result in a lowering of the product's performance and cause a serious accident. Please contact your local Hirose representative for additional information.**

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HRS

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The characteristics and the specifications contained herein are for reference purpose. Please refer to the latest customer drawings prior to use.
The contents of this catalog are current as of date of 04/2018. Contents are subject to change without notice for the purpose of improvements.

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