

# HRL-9/4 立式手動復位限位開關

## Vertical Manual Reset Safety Limit Switch

### 特點 Features

- 強制斷開動作裝置(僅NC接點), 可以在發生像接點熔斷等故障時斷開接點
  - 強化頂部密封結構, 以提高密封性能
  - 內藏接點座具有慢動型: 1NC/1NO、2NC
- Forced open action device(NC contacts only), to disconnect the contact when the contact has fusing and other failures
- Strengthened top seal structure improves the sealing performance
- Built-in contact holder has slow-action: 1NC /1NO and 2NC

### 規格 Specifications

保護等級 Protection level	IP66
壽命 Life	電氣 Electrical 50萬次以上(AC250V 3A、電阻負載) More than 500,000 times (AC250V 3A, resistive load) 30萬次以上(AC250V 10A、電阻負載) More than 300,000 times (AC250V 10A, resistive load)
操作速度 Operating speed	1mm-0.5m/s(HNL-4120型)
動作頻率 Operating frequency	電氣: 30次/分 Electrical: 30 operations/min
接觸電阻 Contact resistance	25mΩ以下 25 mΩ or less
最小使用負載 Minimum working load	DC5V 1mA 電阻負載(N標準參考值) 1mA resistive load below DC5V (N standard reference value)
額定絕緣電壓(Ui) Rated insulation voltage (Ui)	300V
防觸電保護等級 Electric shock protection grade	Class II (雙重絕緣) Class II (double insulated)
污染度(使用環境) Pollution degree (Using conditions)	污染度3(EN60947-5-1) Pollution degree 3 (EN60947-5-1)
耐電壓 Withstand voltage (EN60947-5-1)	同極端子間: 2.5kV Between homopolar terminals: 2.5kV 異極端子間: 4kV Between heteropolar terminals: 2.5kV 各端子和非充電金屬部間: 6kV Between terminals and uncharged metal parts: 6kV
絕緣電阻 Insulation resistance	100MΩ以上 Above 100MΩ
接點間隙 Contact gap	最小2×0.5mm速動型 Minimum 2×0.5mm quick-action type, 最小2×2mm慢動型 Minimum 2×2mm slow-action type
振動 Vibration	誤動作 Malfunction 10~55Hz 0.75mm單振幅 10~55Hz 0.75mm single amplitude
衝擊 Impact	耐久 Duration 1,000m/s <sup>2</sup> 誤動作 Malfunction 300m/s <sup>2</sup>
環境溫度 Ambient temperature	使用時: -20~+70℃ (沒有結冰) Using: -20~+70℃ (With no icing)
環境濕度 Ambient humidity	95%RH以下 Less than 95% RH
質量 Weight	約92g(D4N-1A20R) About 92g (D4N-1A20R)

注1. 上述值為初始值。  
注2. 一旦接點連接標準負載後, 就不可用於連接更小的負載。否則可能導致接點表面粗糙, 從而失去接觸可靠性。

\*1. 保護等級是根據(EN60947-5-1)規格的測試法得出的。使用前務必在實際使用的環境、條件下確認其密封性。開關盒本體具有防塵、防油構造, 但應盡可能保持頭部在沒有碎屑、粉塵、油污、化學品的場所進行使用。否則可能導致過早磨損、損壞或故障。

\*2. 耐久性的條件是使用環境溫度5℃~35℃、使用環境濕度40%~70%RH。其他詳細條件請另行查詢。

\*3. 使用環境溫度為35℃以上時, 禁止使用2回路以上的3A AC250V負載。

\*4. 這個值會因為開關頻率、環境條件、可靠性等級等因素的影響而不同。請事先在實際負載上進行確認。

Note 1. The above values are initial values.

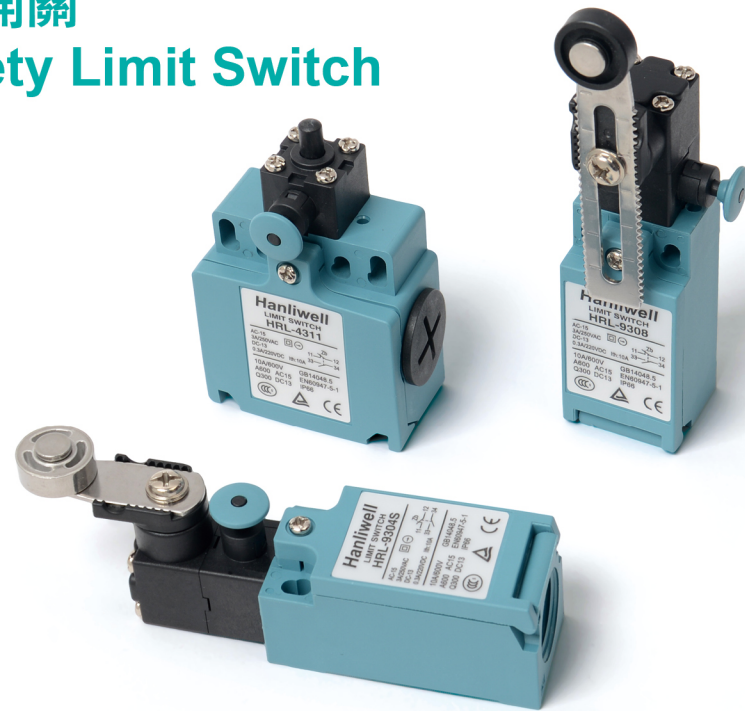
Note 2. Once the contact is connected to a standard load, it can not be used to connect a smaller load. If so, the contact may result in rough surface, thus losing contact reliability.

\*1. The protection level is gotten based on test method of (EN60947-5-1). Please make sure its sealing under actual environmental conditions before use. The switch box has dust and oil resistance structure, but it should be used in places without dust, oil and chemicals. Otherwise it may lead to premature wear, damage or malfunction.

\*2. The durability is for ambient temperature of 5℃~35℃ and humidity of 40% to 70% RH. For additional details, please contact us.

\*3. When the ambient temperature is above 35℃, more than 2 circuits 3A 250VAC loads are prohibited.

\*4. The values will vary with different switching frequency, environmental conditions, reliability level and other factors. Please confirm on the actual load in advance.



### 型號說明 Model Number Structure

HRL-□□□  
1 2 3

項目 Item	代號 Code	說明 Description
1. 導管/連接器尺寸 Conduit / connector size	7	Pg13.5 (1導管型) Pg13.5 (1 conduit type)
	9	M20 (1導管型) M20 (1 conduit type)
	2	Pg13.5 (2導管型) Pg13.5 (2 conduits type)
	4	M20 (2導管型) M20 (2 conduits type)
2. 內藏開關 Built-in switch	3	1NC/1NO (慢動型) 1NC/1NO (slow-action type)
	4	2NC (慢動型) 2NC (slow-action type)
	04P	滾珠擺杆型 (樹脂擺杆, 樹脂滾珠) Roller lever (resin lever, resin ball)
	04	滾珠擺杆型 (金屬擺杆, 樹脂滾珠) Roller lever (metal lever, resin ball)
3. 頭部及傳動杆 Head and driving rod	04S	滾珠擺杆型 (金屬擺杆, 金屬滾珠) Roller lever (metal lever, metal resin ball)
	08	可調滾珠擺杆, Form Lock (金屬擺杆, 樹脂滾珠) Adjustable roller lever, Form Lock (metal lever, resin ball)
	08S	可調滾珠擺杆, Form Lock (金屬擺杆, 橡膠滾珠) Adjustable roller lever, Form Lock (metal lever, rubber ball)
	10	可調滾珠擺杆, Form Lock (金屬擺杆, 金屬滾珠) Adjustable roller lever, Form Lock (metal lever, metal resin ball)
	11	頂部柱塞型 Top plunger type
	12	頂部柱塞滾珠型 Top plunger ball type
13	單側懸臂滾珠型 (水平) Unilateral cantilever ball type (horizontal)	
14	單側懸臂滾珠型 (垂直) Unilateral cantilever ball type (vertical)	

注: 導管連接器尺寸常規默認為M20x1.5。

NOTE: The default size of conduit connector is M20x1.5.

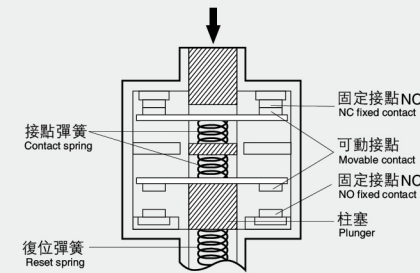
## HRL-9/4 立式手動復位限位開關

## Vertical Safety Limit Switch

### 強制斷開機構 Forced Disconnecting Mechanism

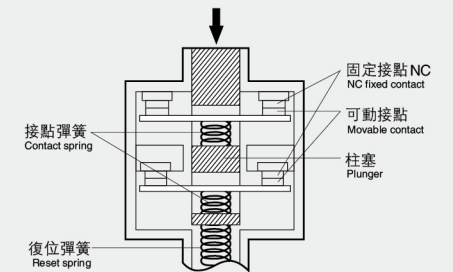
1NC、1NO接點(慢動型)  
1NC and 1NO contacts (slow-action type)

僅限NC接點側有強制斷開構造。  
當發生溶着時, 通過按下柱塞, 可以分離接點, 切斷回路。(符合EN60947-5-1強制斷開操作)。  
Only NC contact has forced disconnect structure.  
When melting occurs, the contact can be isolated by pressing the plunger to cut off the loop. (In accordance with EN60947-5-1 force disconnect operation).



2NC接點(慢動型)  
2NC contacts (slow-action type)

雙側NC接點均具有強制斷開構造。  
當發生溶着時, 通過按下柱塞, 可以分離接點, 切斷回路。(符合EN60947-5-1強制斷開操作)。  
When melting occurs, the contact can be isolated by pressing the plunger to cut off the loop. (In accordance with EN60947-5-1 force disconnect operation).



### 接點形式 Contact Form

型號 Model	接點 Contact	接點形式 Contact form	動作模式 Operation mode	說明 Explanation
HRL-□3□R	1NC/1NO (慢動型) 1NC/1NO (Slow-action type)			僅NC接點(11-12)具有強制斷開功能(⊖)。 Only NC contact (11-12) has forced disconnect function (⊖) 接點(11-12)和(33-34)可作異極使用。 Contacts (11-12) and (33-34) can be used as heteropoles.
HRL-□4□R	2NC (慢動型) 2NC (Slow-action type)			僅NC接點(11-12、31-32)具有強制斷開功能(⊖)。 Only NC contact (11-12, 31-32) has forced disconnect function (⊖) 接點(11-12)和(31-32)可作異極使用。 Contacts (11-12) and (31-32) can be used as heteropoles.

### 動作特性 Operating Characteristics

型號 Model		HRL-□□04P	HRL-□□04	HRL-□□08 *2	HRL-□□10	HRL-□□11	HRL-□□12	HRL-□□13	HRL-□□14
LF	最大Max.	6.45N	6.45N	5.6N	5.4N	10.8N	10.8N	7.5	7.9N
LT	最大Max.	55°	55°	55°	55°	4.5mm	4.5mm	7mm	7mm
PT1	*3	18~27°	18~27°	18~27°	18~27°	2mm	2mm	4mm	4mm
PT2	*4	(44°)	(44°)	(44°)	(44°)	(2.9mm)	(2.9mm)	(5.2mm)	(4.3mm)
OP		--	--	--	--	34 ± 0.5mm	44.4 ± 0.8mm	53 ± 0.8mm	27 ± 0.8mm
TT	*5	80°	80°	80°	80°	(6mm)	(6mm)	(9mm)	(9mm)
DOT	最小Min.*6	50°	50°	50°	50°	3.2mm	3.2mm	5.8mm	5.8mm
DOF	最小Min.*6	20N		20N	20N	20N	20N	20N	20N

注

\*1. 2NC接點的閉路/開路動作的同時性有所參差, 使用時請務必確認。

\*2. 擺杆長32mm時的特性值。

\*3. NC接點為閉路(OFF)狀態時的PT值。

\*4. NO接點閉合(ON)時的PT一般值(僅限1NC/1NO型)。

\*5. 參考值。

\*6. 強制斷路構造的負載和行程值。為保證安全, 請務必保持在規定的上限和下限範圍內。

Note

\*1. The simultaneity of ON / OFF operation of 2NC contacts have difference, please make sure before using it.

\*2. The property value when length of lever is 32mm.

\*3. PT value when NC contact is at open (OFF) state.

\*4. PT common value when NO contact is at close (ON) state (only for 1NC/1NO types).

\*5. Reference values.

\*6. Load and travel values of forced disconnect structure. To ensure safety, be sure to remain within the upper and lower range.

外觀和尺寸 Appearance and Dimension

<p><b>HRL-9304P</b></p> <p>樹脂滾珠 Resin ball 樹脂擺杆 Resin lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>	<p><b>HRL-9304</b></p> <p>金屬擺杆 Metal lever 樹脂滾珠 Resin ball 安裝孔 Mounting hole 導管帽 Conduit cap</p>
<p><b>HRL-9304S</b></p> <p>不銹鋼滾珠 Stainless steel resin ball 金屬擺杆 Metal lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>	<p><b>HRL-9308S</b></p> <p>不銹鋼滾珠 Stainless steel resin ball 金屬擺杆 Metal lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>
<p><b>HRL-9308</b></p> <p>樹脂滾珠 Resin ball 金屬擺杆 Metal lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>	<p><b>HRL-9310</b></p> <p>樹脂軸承 Resin bearing 樹脂滾珠 Rubber ball 金屬擺杆 Metal lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>
<p><b>HRL-9311</b></p> <p>樹脂滾珠 Resin ball 安裝孔 Mounting hole 導管帽 Conduit cap</p>	<p><b>HRL-9312</b></p> <p>樹脂滾珠 Resin ball 安裝孔 Mounting hole 導管帽 Conduit cap</p>
<p><b>HRL-9313</b></p> <p>樹脂滾珠 Resin ball 安裝孔 Mounting hole 導管帽 Conduit cap 操作方向 Operating direction</p>	<p><b>HRL-9314</b></p> <p>樹脂滾珠 Resin ball 安裝孔 Mounting hole 導管帽 Conduit cap 操作方向 Operating direction</p>

外觀和尺寸 Appearance and Dimension

<p><b>HRL-4304P</b></p> <p>樹脂滾珠 Resin ball 樹脂擺杆 Resin lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>	<p><b>HRL-4304S</b></p> <p>不銹鋼滾珠 Stainless steel resin ball 金屬擺杆 Metal lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>
<p><b>HRL-4304</b></p> <p>樹脂滾珠 Resin ball 金屬擺杆 Metal lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>	<p><b>HRL-4308S</b></p> <p>不銹鋼滾珠 Stainless steel resin ball 金屬擺杆 Metal lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>
<p><b>HRL-4308</b></p> <p>樹脂滾珠 Resin ball 金屬擺杆 Metal lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>	<p><b>HRL-4310</b></p> <p>樹脂軸承 Resin bearing 樹脂滾珠 Rubber ball 金屬擺杆 Metal lever 安裝孔 Mounting hole 導管帽 Conduit cap</p>
<p><b>HRL-4311</b></p> <p>樹脂滾珠 Resin ball 安裝孔 Mounting hole 導管帽 Conduit cap</p>	<p><b>HRL-4312</b></p> <p>樹脂滾珠 Resin ball 安裝孔 Mounting hole 導管帽 Conduit cap</p>
<p><b>HRL-4313</b></p> <p>樹脂滾珠 Resin ball 安裝孔 Mounting hole 導管帽 Conduit cap 操作方向 Operating direction</p>	<p><b>HRL-4314</b></p> <p>樹脂滾珠 Resin ball 安裝孔 Mounting hole 導管帽 Conduit cap 操作方向 Operating direction</p>