

# 2774-2777 Threaded DryLoc™ pH/ORP Electrode



## Description

The +GF+ SIGNET 2774 - 2777 pH and ORP Electrodes feature a unique foul-proof DryLoc™ connector with gold-plated contacts designed specifically for use with the +GF+ SIGNET 2750 and 2760 preamplifiers, sensor electronics, and connectors. These dependable and highly responsive electrodes feature a Teflon™ double reference junction and a large reference chamber that combine to extend the service-life. Embedded positioning of the temperature element in the pH/ORP sensing tip allows the

temperature response to be quick and accurate. The electrodes are offered with either flat or bulb style sensing elements. The flat versions allow sediment and particles to sweep past the measurement surface, minimizing risks of abrasion, breakage and coating. The bulb versions can be used for general-purpose applications. Due to the specially designed chambers which keep electrolyte in place, all versions can be mounted at any angle, even inverted.

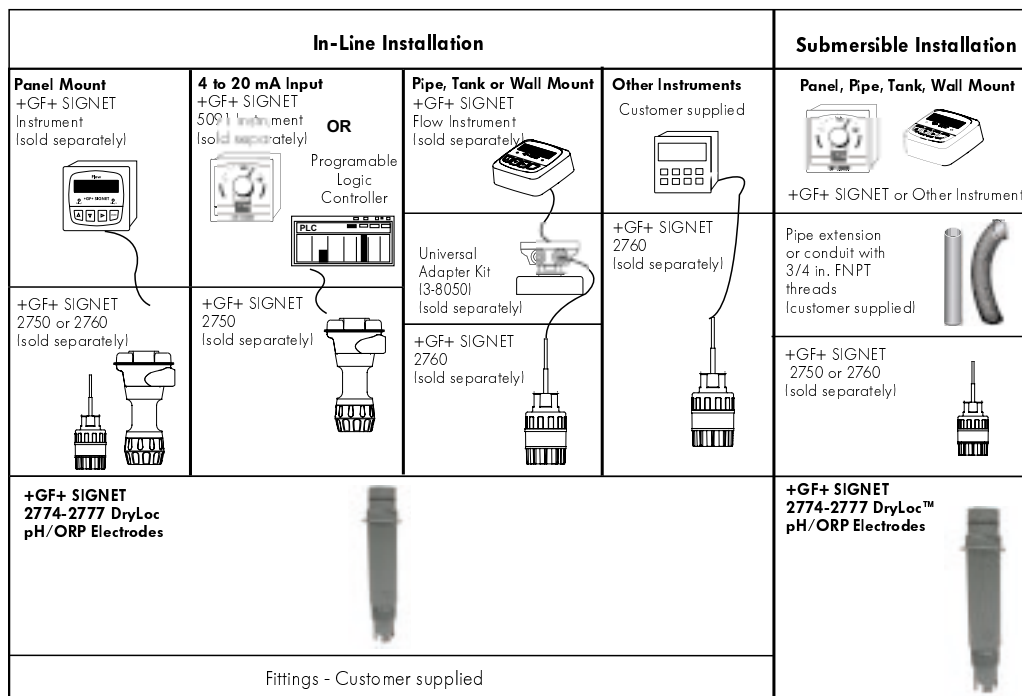
## Features

- Durable DryLoc™ connector with gold plated contacts
- Special design allows mounting at any angle
- Quick temperature response
- Easy sensor replacement using DryLoc™ electrode connector
- High temperature versions available
- Mounts into standard 3/4 inch threads

## Applications

- Water Treatment & Water Quality Monitoring
- Demineralizer, Regeneration & Rinse
- Cooling Tower and Boiler Protection
- Aquatic Animal Life Support Systems
- Pool and Spa Control
- Neutralization Systems

## System Overview



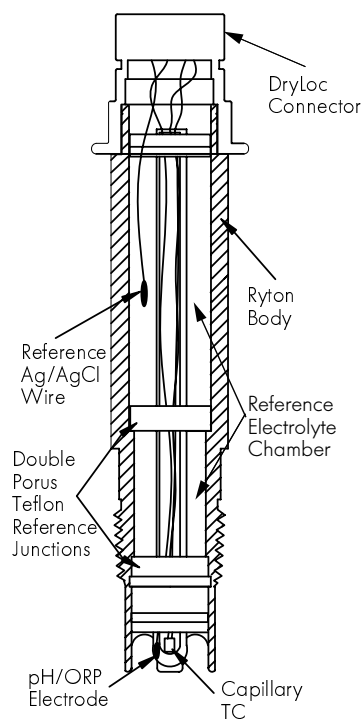
## Compatible Instruments

The 2774-2777 Threaded DryLoc™ pH/ORP electrodes are compatible with the following +GF+ SIGNET Instruments and Sensor Electronics:

8900 2750  
 8750 2760  
 5700

## Electrode Key Features and Benefits:

- Ryton™ body for chemical compatibility to most harsh chemicals. Also able to withstand high temperatures.
- Porous Teflon™ reference junctions are highly chemically resistant; resists fouling and dirt buildup.
- Double reference junctions with large electrolyte chamber protects Ag/AgCl wire for a prolonged sensor life.
- Capillary TC (temperature sensor) embedded in tip of pH/ORP electrode for quicker temperature response than most other electrodes on the market.
- DryLoc™ connector with corrosion resistant gold pins for quick and easy sensor removal.



Electrode Cut-Away View

## Model 2774 Compatibility Selection Chart for Electronics and Instruments

		Compatible Instruments				Other Mfr.'s Instruments*
		5700	8750	8900	Accepts 4 to 20 mA input	
Compatible Electrodes	<b>2774</b>	2760-1, -2	2760-1, -2	-	-	2760-3, -4
	<b>2774-1</b>	-	-	any 2750	any 2750	2760-3, -4
	<b>2775</b>	2760-1, -2	2760-1, -2	any 2750	any 2750	2760-3, -4
	<b>2775-1</b>	-	-	-	-	2760-3, -4
	<b>2776</b>	2760-1, -2	2760-1, -2	-	-	2760-3, -4
	<b>2776-1</b>	-	-	any 2750	any 2750	2760-3, -4
	<b>2777</b>	2760-1, -2	2760-1, -2	any 2750	any 2750	2760-3, -4
	<b>2777-1</b>	-	-	-	-	2760-3, -4
*Must have internal preamplifier in instrument; Must use sensor with compatible temperature element; contact technical service for questions						

## Key Features and Benefits:

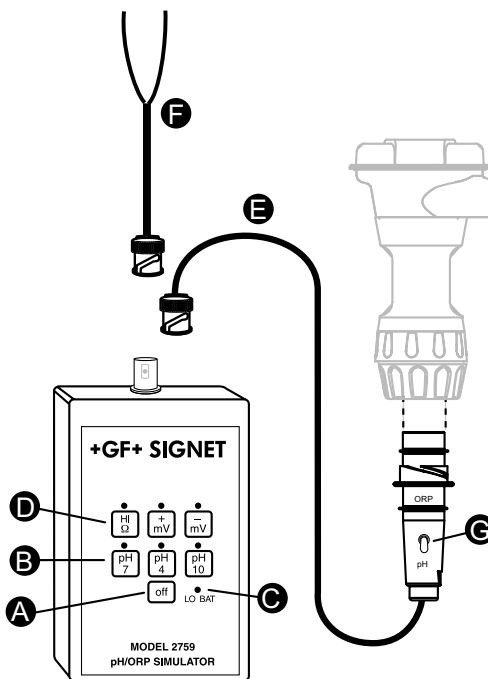
### 2759 pH/ORP System Tester

The +GF+ SIGNET 2759 pH/ORP Simulator is a battery-powered millivolt generator that simulates pH values of 4, 7 and 10, plus ORP values of  $\pm 700$  mV. This device is useful as a troubleshooting aid and for general verification of system operation. It is not a substitute for periodic system calibration with pH buffers or test solutions.

Accessory adapter cables (sold separately) enable the 2759 to connect directly to +GF+ SIGNET 2720 and 2760 preamplifiers or 2750 pH/ORP Sensor Electronics.

The adapters include a selector switch for pH or ORP simulation. The switch triggers automatic sensor-recognition software in +GF+ SIGNET pH/ORP instrumentation.

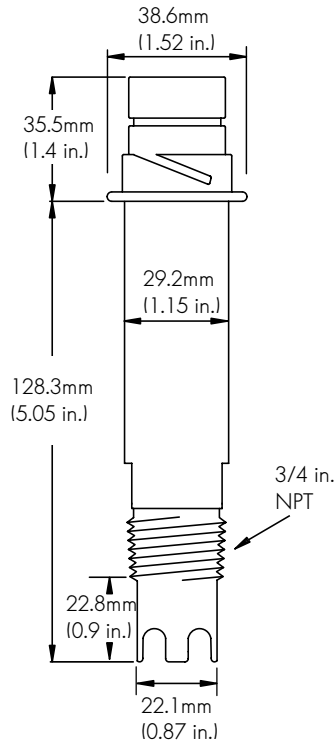
- A) Power OFF Button
- B) Output simulation buttons and indicators. Simulate pH and ORP output at five fixed values: pH 4, pH 7, pH 10, -700 mV and +700 mV. Pressing one of these buttons turns the 2759 on.
- C) Low battery indicator
- D) High switch: Adds  $1000\Omega$  resistance in series with output. Simulates high impedance of pH electrodes. Used to verify proper preamplifier operation.
- E) 3-2759.391: Adapter cable for use with 2750 and 2760
- F) 3-2759.390: Bypass adapter cable (included with 2759)
- G) Mode selector switch: Trigger automatic sensor recognition software in +GF+ SIGNET pH/ORP instrumentation.



#### Application Notes:

- Use the flat glass electrodes when a self-cleaning feature is desired; especially useful in applications with abrasive chemicals.
- Use bulb protected electrodes for general purpose applications
- ORP electrodes are generally used for chemical reaction monitoring, not control.
- Ensure that sensor materials are chemically compatible with the process liquid.

## Dimensions



## Specifications

### General

Compatibility:

+GF+ SIGNET Models 2750 and 2760

Operating Range:

- 2774/2776: 0 to 14 pH
- 2775/2777: +/-2000 mV (ORP)

Pipe Size Range: 3/4 inch and up.

Mounting:

- In-line/vertical mounting: Use the electrode's 3/4 in. threads to install into pipe fitting. Electrode can be mounted at any angle.
- Submersible mounting: Use threads on Model 2750 or 2760; requires 3/4 in. NPT or ISO7-R/ 3/4 in. male threaded extension.

Reference:

Electrolyte:

KNO<sub>3</sub>/KCl acrylamide gel

Element: Ag/AgCl

Temperature Sensor:

- pH: 3K $\Omega$  or PT1000 RTD
- ORP: none

Temperature response time:  $\tau_{95\%} < 1$  min.

Primary Functions:

- 2774 and 2775:  
Flat surface resists fouling
- 2776 and 2777:  
Bulb surface for general use

### Wetted Materials:

Body: Ryton™

Reference junctions: Teflon™

Sensing surface:

- Glass membrane: (pH)
- Platinum: (ORP)

O-rings: FPM

### Max. Temperature/Pressure rating:

Operating Temperature:

-10°C to 85°C (14°F to 185°F)

Maximum Operating Pressure:

10.3 bar (149 psi)

Storage Temperature:

> -10°C (15°F)

Higher temperature and pressure sensors are available.

**Shipping Weight:** 0.25 kg (0.55 lbs.)

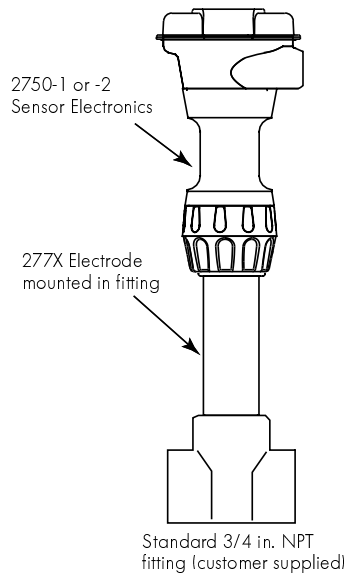
### Standards and Approvals

- Manufactured under ISO 9001:2000 for Quality and ISO 14001:1996 for Environmental Management

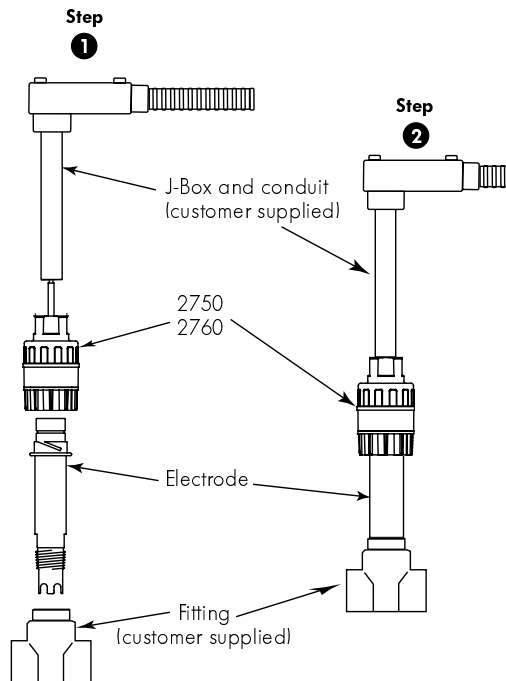
## Installation

- The 2774-2777 electrodes feature a thread close to the sensor end which allows the sensor to thread directly into a standard NPT pipe tee.
- Electrodes must be immersed in liquid. Keep pipe full at all times to avoid dehydration.
- Any mounting angle is acceptable for Models 2774-2777.

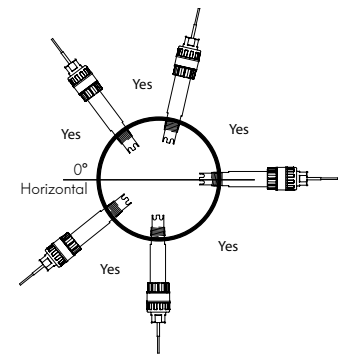
3-2750-1, -2



3-2750-3, -4  
3-2760-1, -2, -3, -4



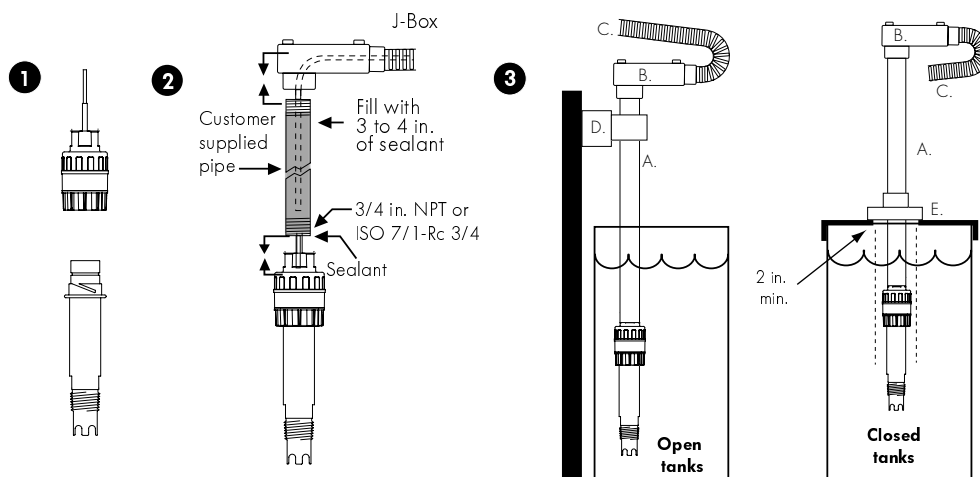
## Sensor Mounting



Models 2774-2777 pH/ ORP electrodes are designed to be mounted in any position, even upside-down.

Sensors are designed to install in tanks by attaching conduit to the 3/4 inch threads at the top of the accompanying preamplifier or sensor electronics. Installing a sensor can simply be done by following these steps:

- 1) The dual O-ring set at the top of the electrode fits very tightly into the preamplifier. Use a small amount of lubricant (non-petroleum based) to assist the assembly.
- 2) To prevent moisture from migrating into the preamplifier, backfill the conduit with 3 to 4 inches of sealant.
- 3) Mount electrodes in a location with ample clearance to remove them for periodic cleaning and recalibration. Choose a location that keeps the electrode glass completely submerged at all times.

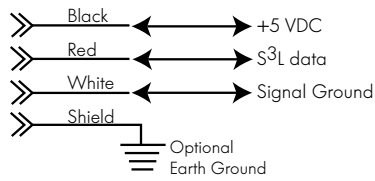


Caution: If liquid level is not constant, always ensure liquid contact with electrode tip

# Wiring

## S<sup>3</sup>L Wiring

- 2750/2760 Submersible to 8900

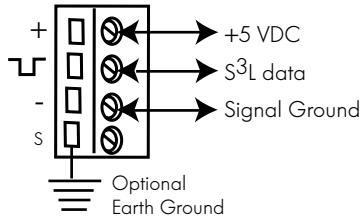


Sensor Electronics



Instrument

- 2750 In-Line and 8050/8052 J-Boxes to 8900



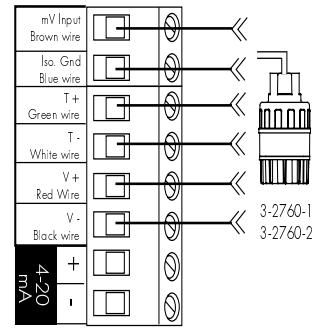
Sensor Electronics



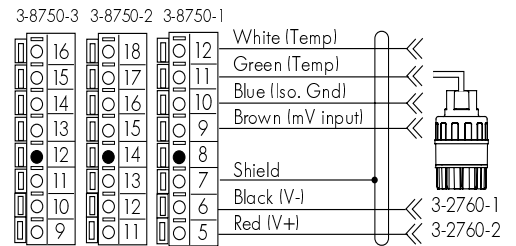
Instrument

## mV Wiring

- 2760 to 5700 pH/ORP Monitor



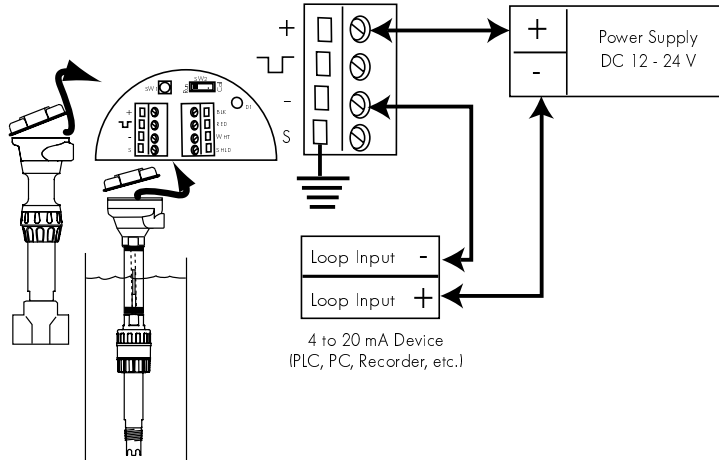
- 2760 to 8750 pH/ORP Transmitter



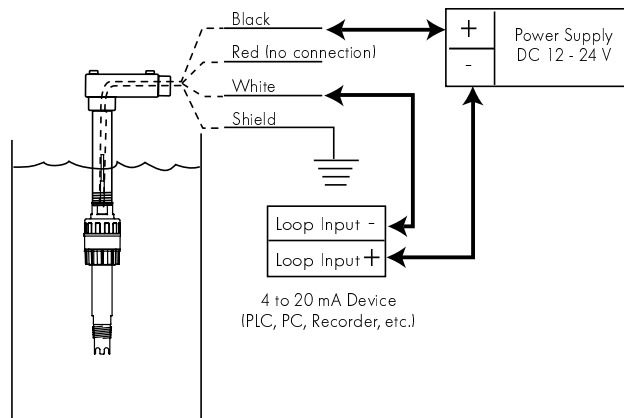
Connect this terminal ● to Earth GND to reduce electrical interference.

## 4 to 20mA Loop Connections

- 2750 with J-Box



- 2750 without J-Box



## Ordering Information

Electrode Part Number- Choose either a pH or ORP Electrode	
pH Electrodes	
<b>3-2774</b>	Flat pH surface electrode
<b>3-2776</b>	Bulb pH electrode with bulb protection
Temperature Element - Choose one	
-	3K Ohm RTD for pH for connection to 8750 or 5700 instruments when used with the 2760 preamplifier.
<b>-1</b>	PT1000 RTD for pH for connection to the 8900 when used with the 2750 sensor electronics
Special Order Options for pH Electrodes - Options -HT and -C can only be used with the 3-2721 preamplifier. (These options cannot be used with the 2750 or 2760)	
<b>-HT</b>	For high temperature and high pressure applications, up to 110°C (230°F) @ 150 psig; DryLoc™ connector is removed and replaced with a 4.6m (15 ft.) cable.
<b>-C</b>	Remove DryLoc™ connector and add 4.6m (15 ft.) cable. Other cable lengths are available
<b>-ISO</b>	ISO 7/1 R - 3/4 Threaded electrodes are available.
<b>3-2776</b>	<b>Example Part Number</b>

ORP Electrodes	
<b>3-2775</b>	Flat ORP surface electrode
<b>3-2777</b>	Bulb ORP electrode with bulb protection
Temperature Element - Choose one	
-	10 K ID resistor for ORP electrodes for connection to the 8750 and 5700 when used with the 2760 preamplifier or the 8900 when used with the 2750 sensor electronics
<b>-1</b>	No T.C. for ORP electrodes for use with other suppliers instruments when used with the 2760 connector
Special Order Options for ORP Electrodes - Options -HT and -C can only be used with the 3-2721 preamplifier. (These options cannot be used with the 2750 or 2760)	
<b>-HT</b>	For high temperature and high pressure applications, up to 110°C (230°F) @ 150 psig; DryLoc™ connector is removed and replaced with a 4.6m (15 ft.) cable.
<b>-C</b>	Remove DryLoc™ connector and add 4.6m (15 ft.) cable. Other cable lengths are available
<b>-ISO</b>	ISO 7/1 R - 3/4 Threaded electrodes are available.
<b>3-2775</b>	<b>Example Part Number</b>

Preamplifiers - Choose one (required for installation of any pH or ORP electrode)	
<i>The units below can be used with the +GF+ SIGNET 8900 or as a blind transmitter with 4 to 20 mA output; for connection to a PLC, PC, chart recorder, or other devices requiring a 4 to 20mA input.</i>	
<b>3-2750-1</b>	In-line Sensor electronics w/junction box
<b>3-2750-2</b>	In-line Sensor electronics w/junction box and EasyCal
<b>3-2750-3</b>	Submersible Sensor electronics w/4.6m (15 ft.) cable and 3/4 inch NPT conduit threads
<b>3-2750-4</b>	Submersible Sensor electronics w/4.6m (15 ft.) cable and ISO 7/1-R 3/4 conduit threads
<i>The preamplifiers below can be used with +GF+ SIGNET 8750 and 5700. Can also be used with other suppliers instruments.</i>	
<b>3-2760-1</b>	Preamplifier with 4.6m (15 ft.) cable and 3/4 inch NPT conduit threads
<b>3-2760-2</b>	Preamplifier with 4.6m (15 ft.) cable and ISO 7/1-R 3/4 conduit threads
<i>The connectors below can be used with other suppliers instruments not requiring a preamplified signal</i>	
<b>3-2760-3</b>	DryLoc™ connector with 4.6m (15 ft.) cable and 3/4 inch NPT conduit threads
<b>3-2760-4</b>	DryLoc™ connector with 4.6m (15 ft.) cable and ISO 7/1-R 3/4 conduit threads

Mfr. Part No.	Code	Mfr. Part No.	Code
3-2774	<b>159 000 955</b>	3-2775	<b>159 000 957</b>
3-2774-1	<b>159 000 956</b>	3-2775-1	<b>159 000 958</b>
3-2776	<b>159 000 959</b>	3-2777	<b>159 000 961</b>
3-2776-1	<b>159 000 960</b>	3-2777-1	<b>159 000 962</b>

## Model 2774-2777

### Ordering Notes:

- 1) pH and ORP sensors require connection to model 2750 or 2760.
- 2) To replace electrodes, simply untwist from preamplifier to replace with new electrode.
- 3) Conduit and mounting brackets for submersible installation must always be used (customer supplied).
- 4) All of these sensors can be mounted upside-down.

# Accessories and Replacement Parts

Mfr. Part No.	Code	Description
3-0700.390	<b>198 864 403</b>	pH Buffer kit
3-2759	<b>159 000 762</b>	pH/ORP System Tester
3-2759.391	<b>159 000 764</b>	Adapter Cable for use with 2750/2760
3-2721	<b>198 864 610</b>	Remote mount pH/ORP preamplifier

## For more information, contact your local George Fischer Sales Office:

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